The Boston Medical and Surgical Journal

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December 30, 1915

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Original Articles.

FOOT STRAIN AND OTHER COMMON FOOT DEFECTS.

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NUMEROUS disappointments in treatments of common foot troubles occur notwithstanding our extensive knowledge of these conditions; and patients and physicians both are surprised very frequently at unexpected poor results of medical care; yet it seems nearly impossible to discover really new facts relating to feet. The writer believes accordingly that further advances must be made mainly through more careful examinations of what is known now but commonly forgotten.

Foot strain and other defects will be illustrated in this paper by a number of actual cases; and these will be followed by a discussion of the facts presented, concluding with a few revised elaborated general principles of treatment. Numerous photographs are used to facilitate descriptions, several different pictures of the same case being employed when they give added clearness. Soles of feet have been photographed with patients standing on a thick glass plate with a mirror arranged beneath it so as to reflect images conveniently into the camera, thus securing weight-bearing positions. Only those facts in each history are reported, for the sake of brevity, that relate particularly to the features being illustrated.

A rough grouping of cases has been made into: (1) Simple relaxations and strains. (2) Rigid flat foot and allied conditions. (3) Foot strain accompanying other distinct pathologic states. (4) Miscellaneous lesions confused or associated with foot strain.

SIMPLE RELAXATIONS AND STRAINS.

Lack of order and completeness in treatment. The first case, Figs. 1, 2, 3, 4, is that of an eighteen year old girl who slowly developed weakness and pain in the feet six weeks before an orthopedic surgeon was consulted. He immediately recognized that the shoes were too tight and that the toes were cramped, also that the feet were relaxed and slightly pronated. Adhesive plaster supports were put on the ankles and larger, better shaped shoes with lower heels were recommended. Figs. 1 and 2 show the slightly pronated relaxed foot with slightly crumpled toes. Fig. 3 shows the original shoe worn, and Fig. 4 the recommended one. The patient returned in two weeks with symptoms increased, having been obliged to give up wearing the prescribed shoes on account of the greater discomfort which they produced. She gave a history on further questioning of recent loss of appetite and weight, and she looked pale and sallow.

New directions next were given to return to the original shoes until local pains subsided, then to change again gradually to the ones recommended. The feet were restrapped meanwhile, strappings being changed frequently enough to give continuous support. Tonic-eliminative drugs were prescribed

at the same time and in three weeks she had improved greatly. Her appetite was much better, the pallor of the face had disappeared, she was feeling in better spirits, and foot symptoms had practically gone. In another week she had made the change to the better shoes and was able to dispense entirely with artificial supports.

First observations made in this case were correct ones, but the trouble arose from omissions

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in considering facts later brought to notice; and the enormous numbers of persons who adjust their footwear without proper medical advice obviously owe poor results obtained from arch supports and orthopedic shoes to similar omissions. Treatments must be something more than merely local mechanical ones. General conditions have to be thought of in every instance because a large proportion of all cases of simple strain give histories of overwork, debility, "auto-intoxication" or other vague run-down states which should have medical care to ensure quickest recovery.

Physicians themselves too frequently treat foot strains as mechanical weaknesses, to be supported simply with mechanical props, or they tinker surgically with feet to improve only local structural peculiarities. Such mechanical or surgical methods are necessary for success very often, yet the fact remains that failures which still occur after them originate in neglect of internal medical treatments. The latter correct complex physiologic peculiarities which all patients possess in addition to their anatomic ones.

Too extreme abrupt changes. Tolerance of high heels. The second case, Figs. 5, 6, 7, 8, is a well developed, muscular young woman of twenty-two years. She is a diving girl in a theatrical troupe. Her friends told her that shoes with high heels and pointed toes were bad for the feet, so she purchased some flexible, broad toed, low heeled ones, making an abrupt, extreme change from one to the other. Furthermore, she had been wearing store arch supports in the first ones.

The result of the change was that muscles of feet and legs became very tired with additional continuous work they were suddenly compelled to do, and finally one fatigued ankle was so badly twisted that some of the small ligaments of the foot were injured, ecchymoses appearing beneath the skin. Complete rest in a plaster cast was necessary for a few days; and then, as the patient still desired to try to become accustomed to the better shaped shoes, the feet were firmly strapped and she

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was allowed to walk. She persevered for a month, but finally, owing to the difficulties in obtaining medical attention regularly, she went back to the old shoes with supports. Simple medicines tried in routine manner during the period of treatment produced very little change in her symptoms, as was anticipated, for evidently bad results could be traced easily to the change made from nearly a maximum to nearly a minmum amount of support. Original shoes are figured in 5 and 6, and improved shapes in 7 and 8. This case represents the unskillful use of a very useful kind of footwear, and also exhibits the tolerance which is shown for high heels when feet have become accustomed to them.

Deformities without Symptoms. Symptoms without Deformities. Figs. 9 and 10 are introduced to show that marked anatomical peculiarities are not necessarily associated with painful pathological symptoms. The fact that pathological symptoms may be present in the absence of great anatomic variations is indicated in Figs. 11, 12, 13, 14.

The foot figured in 9 was declared by the patient to be normal and to have been so for many years. This statement means that structural peculiarities developed so gradually that functional changes compensated perfectly for anatomic ones without destroying at any time the usually healthy balance. It shows that symptomless hallux valgus is possible since this man is at work regularly, using the feet an ordinary amount. The flattened, pronated foot in Fig. 10 is symptomless, while the other foot of the same person, Fig. 11, although better looking, is weak and painful from an old injury.

The foot and footwear figured in 12, 13, 14 appear fairly good, yet acute symptoms of several weeks' duration were complained of. The foot is somewhat pronated, but not more so than many average symptomless feet, the toes are not crumpled, the longitudinal arches have not sagged much and the shoes are of good shape and size. There are many feet of worse appearance in which no symptoms are noticed, and it seems this case fairly presents pathologic symptoms without marked anatomic peculiarities.

Variations in Shapes and Sizes. "Normal looking" is a term frequently used loosely in descriptions of feet, but it possesses limited significance when long narrow types, Fig. 15, short broad ones, Fig. 16, unusually developed feet, Fig. 17, and variations in sizes, Figs. 17, 18, are noted. The photographs were taken at the same distance from the camera under similar conditions and are directly comparable. All these might be called fairly normal looking, and they demonstrate that there are wide individual variations in shapes and sizes which

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should be recognized as individual peculiarities with very little pathologic significance.

Foot plates in simple relaxations and strains. (A) A man desired some new plates to replace old ones which he had worn and broken. Figs. 19, 20, 21, 22, 23. He was six feet, four inches tall, weighed over two hundred and fifty pounds, was middle aged and worked in an iron foundry. His feet were large, relaxed, and flattened as shown in 22 and 23. Impressions of the feet were taken and a pair of low, flat plates were made. Fig. 21. These unexpectedly proved very uncomfortable, because they forced up transverse arches too much and did not afford enough support at inner edges of the feet. They had to be discarded in spite of much tinkering and after considerable perseverance from the patient. A second pair was made which proved entirely satisfactory. Figs. 19, 20.

The difficulty in this case was the failure to inquire sufficiently at first about plates which had been broken, as later it was found they had supported him just as did the last pair made.

The subsequent history of this patient was as follows: He was cautioned against unnecessary use of foot supports and advised to get accustomed to the lesser support afforded by the discarded flat plates. This he succeeded in doing in two months, and then at this rather late date it was observed he was pale and anaemic looking although of unusual muscular strength and of large stature. Medicinal tonics were prescribed and these seemed to hasten his recovery appreciably, for in another month he was feeling much improved in health and had discarded all supports.

(B) A middle aged woman of average height and of slightly more than average weight first tried foot plates, then very flexible shoes, and finally shoes with moderately stiff shanks, yet still continued to have foot symptoms. Figs. 24, 25, 26. Like many other persons, she came for advice, desiring something new in way of treatment, but she was relieved soon by usual methods. First, she had consulted a well known orthopedic surgeon a year previously who fitted plates shown in Fig. 24. These relieved her and she passed quickly from his care. She continued to wear the supports for several months until they began to feel uncomfortable, instead of discontinuing them as soon as possible when the strain had subsided. She bought shoes with very flexible shanks next, and found the additional exercise they gave the feet after long continued support was beneficial for a few months. Finally, the feet grew less comfortable in flexible shoes, and stiffer ones were procured, Fig. 26, which served well for a few more months; but at last she came for advice again with a history of

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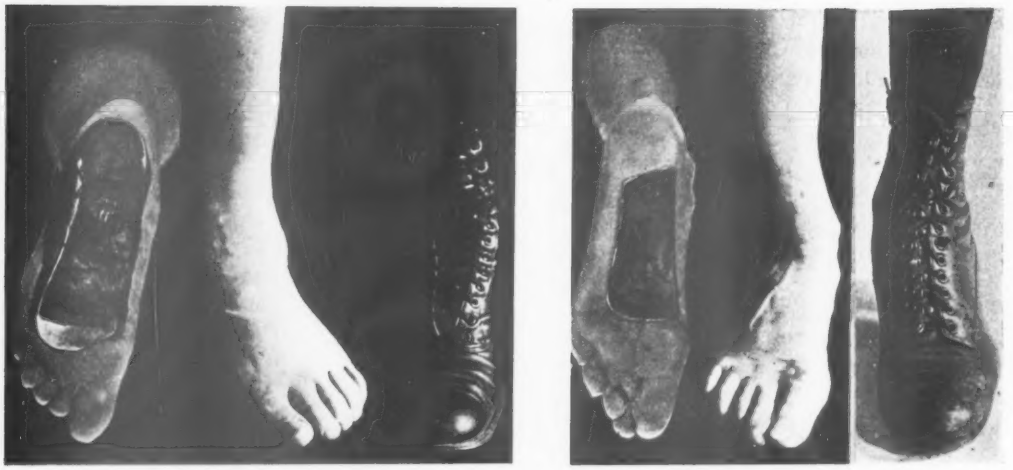

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mild chronic gastro-enteric trouble, recent overwork and with a sub-acute exacerbation of the digestive disturbance. Internal medical measures were then prescribed that had been successfully used previously in relieving similar gastric distress, and the feet were strapped. She was told to return to original foot plates until foot symptoms subsided, but to stop wearing them soon and to continue with moderately stiff shoes. She was also told to expect a return of foot symptoms whenever she became tired out for protracted periods, run down and her digestion upset. It was explained to her that vascular peculiarities probably undermined healthy conditions of the feet at such times and weakened them whether plates were worn or not, also regardless of special kinds of footwear. She responded promptly to strappings, plates and medicines, and within a few weeks needed no further care.

(C) A slender, rapidly growing girl of thirteen wore plates for twelve months continuously and had a recurrence of foot strain at the end of her school year. Figs. 27, 28, 29. She wanted to know what to do when her arch supports were no longer satisfactory. Examination showed the slender feet slightly relaxed, Fig. 28, and the shoes large enough and of fairly good shape, Fig. 29. The steel plates were made of very light spring steel, Fig. 27, and were doing their work just well enough. The treatment suggested was rest accompanied with a few simple hygienic regulations, and the feet were temporarily supported with straps. She was told to change neither plates nor shoes, and that presumably she would need artificial supports for some time while she continued to grow rapidly. In three weeks her symptoms had subsided and she did not discard the plates which she had erroneously judged to be worthless.

(D) A middle aged woman had very badly relaxed feet. She had drooping shoulders, poor posture and was generally relaxed although of average stature and weight. She had been in this debilitated state for many years. Fig. 30 shows her foot without weight, and Fig. 31, with weight upon it. The feet were strapped and tonics prescribed but their good effects were transitory. These treat-

30 and 31 32

ments did not compensate long for very bad personal care the patient took of herself. Pains in the heels were complained of, and felt pads were adjusted with a little temporary relief. Low, flat plates, similar to Fig. 24, were made and readjusted several times, but they caused pain in the calves of the legs when too low, and when raised produced strain of the plantar fascia resulting in pains in the heels. The patient was told by a number of orthopedic surgeons that she must endure some discomfort but she finally consulted another orthopedist who fitted Whitman plates successfully which the writer figures in 32. These have given complete satisfaction for many months, but it must be added that the patient's general condition also has somewhat improved so that some credit must be given improved vascular states for good results seen.

33 34 35

(E) A middle aged woman who has been obliged to work very hard under poor hygenic conditions has chronically relaxed feet. Figs. 33, 34, 35. She has been through an experience similar to the preceding patient, has had made for her low, flat plates, also Whitman plates, and has tried special shoes, felt pads and straps. The most important prescription, proper regulation of personal hygiene, was impossible for a long time and consequently she has hobbled around at her work with the feet firmly bound up in adhesive plaster, because this method of treatment has afforded most comfort for many months. Finally the needed rest was secured and new Whitman plates recently fitted are proving satisfactory.

Flexible Shoes have been considered among the cases given and do not require further illustration. They may be beneficial or harmful, depending on the skill and understanding shown in their prescription. They are physiologic opposites of plates, and the same comprehensive handling is needed with them as with the latter.

RIGID FLAT FOOT AND ALLIED CONDITIONS.

It is impossible to discuss rigid flat foot very satisfactorily when so little is known of underlying vascular peculiarities which produce these conditions. We have no means of measuring clinically the quantitative variations occurring from time to time among all numerous constituents of blood plasma, although physiologists have demonstrated in blood of animals temporary variations among circulating food substances immediately after meals; and although it is possible now with rather complicated clinical tests to ascertain proportions of a few substances like circulating urates in given samples

of human blood. The very large majority of quantitative proportions, however, have yet to be found among numerous waste products, food substances, intermediate chemical combinations and internal secretions present in this vascular soil, upon which all tissues depend directly for their health and growth.

All that can be said at present is that there may be some additional substance, or group of substances, or some unusual proportion of an ordinary constituent, in circulation in rigid flat foot which produces irritations of synovial membranes and increased stiffness in the muscles. There are no methods of telling surely whether muscle spasm in such instances is a simple reflex phenomenon, or is due directly to influences of circulating substances upon muscles, or whether there are combinations of these two theoretical possibilities. We do know, however, that circulating bacteria, lodging and developing within joints, will set up inflammatory changes and that the latter may produce joint adhesions. It is a well known fact also that there is often increased reflex spasm in muscles controlling inflamed joints. It seems not improbable, therefore, sometimes that a group of bacteria, or their toxins, may be causative agents in rigid foot conditions. Different grades of virulence in bacteria and in bacterial products are recognized, and make it easy to account theoretically for all the many varying degrees of stiffness which are found clinically in feet, as the latter are affected by these variable irritants. At times there appear to be selective actions in these unrecognized substances, or special lowered resistances in certain groups of muscles and ligaments, that result in some parts becoming more affected than others. This is the case in spasm of peroneal muscles, also in osteal changes at insertions of Achilles tendons and plantar fasciae, where calcifications and spur formations frequently occur, as will be shown later. Fig. 63. Discussion of selective actions of circulating substances and resistances of particular tissues, however, cannot be entered upon in this paper.

We know only that some feet gradually become painful and stiff instead of becoming painful and pathologically relaxed, also that rigid types often run longer courses than mild simple relaxations. Benefits are derived in rigid states from protective strappings and supports, as in relaxed ones, but in addition there often are needed in rigid types ether manipulations to break adhesions and to restore normal positions. Plaster casts are required too for complete rest and to preserve corrected positions. Local spasms of peroneal muscles have been treated by divisions of peroneal tendons to prevent increasing deformity, but underlying causes are not influenced by this method.

Two cases only of rigid feet are figured because photographs resemble so closely the relaxed conditions already shown.

(A) The first is a school girl of fifteen years whose feet gradually stiffened and became painful. She is a strong, healthy appearing girl and no etiologic factors for her troubles have been discovered. She recovered completely in six months' time with the aid of supportive strappings, and with foot plates and tonics. Figs. 36 and 37 indicate the appearance of the feet, showing that they exhibit very little pronation. Motions of the feet in all directions were considerably limited, and there was stiffness in both lower legs and in both feet, but no evidence of spastic paralysis of central origin.

(B) The second patient is a woman of sixty, with rigid flat foot of several years' duration. Peroneal muscles are affected more than others but all are involved. There is a moderate varicose condition of the veins and longitudinal arches have sagged. Figs. 38 and 39. Strappings and foot plates together make this patient so comfortable that she prefers them to an ether manipulation and plaster casts. She has been given tonic drugs and eliminants with slight benefit.

(C) An interesting condition is shown in Fig. 40. This young girl of sixteen had a very flexible relaxed foot until she twisted the ankle severely twice, thus setting up a chronic inflammation. Marked tenderness and some abnormal swelling are present now over the external malleolus. These pathological symptoms probably indicate strained or torn ligaments for x-rays show no bony defects. The muscles, although weakened and relaxed, respond quickly still to protect the ankle, as the tightly contracted extensor tendons indicate in the photograph. They tighten quickly and relax again immediately when shifting strains upon the ankle due to motions of the body cease.

The differences between muscular action in this last traumatic case and sluggish changes of tense muscles in the first mentioned rigid flat foot case are so obvious, that it requires very slight imagination to picture some circulating ir-

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ritant in some cases acting upon joints, or muscles, or their controlling muscular nerves, to produce continuous increased muscular tenseness. The same tonic-eliminative medicines do not have as marked effects in treatment usually as they do in relaxed debilitated conditions, yet they have been prescribed with considerable benefit apparently in some instances. There seem to be no good reasons, moreover, why attempts should not be made to put circulating blood into best possible condition in these rigid types as well as in debilitated persons; and, when simple routine measures fail, why consultations also with medical internists should not be made freely to secure correction of difficultly regulated vascular tendencies.

FOOT STRAIN ACCOMPANYING OTHER DISTINCT PATHOLOGIC STATES.

Infantile paralysis often leaves patients with foot deformities which require leg braces and surgical operations. These special methods of treatments cannot be discussed, but foot plates are frequently used also to redistribute pressures and to assist in restoring foot balance. Plates are used besides to minimize static strains and to increase the comfort of patients with progressive deforming arthritis, and after fractures of leg and ankle bones.

(A) A case of infantile paralysis in a young woman of eighteen is seen in Figs. 41, 42, 43, 44, 45 46. She previously had her foot deformity partly corrected by operation, and since then with assistance of the plate figured in 43 and 44, can walk several miles and dance as much as desired. The appearance of the supported foot in a low shoe is shown in Fig. 46.

(B) A case of arthritis deformans in a woman of fifty is shown in Figs. 47 and 50. This patient is able to walk as much as needed for management of a home and the care of an invalid woman of eighty who depends wholly upon her. She finds that plates with flanges, figured in 48 and 49, help to make her walking much easier.

(C) A case of fracture of both leg bones above the ankle, followed by an open operation with bone grafts is shown in Fig. 51. The swelling had not entirely subsided when the photograph was taken and the ankle was then being supported with adhesive plaster straps. A plate was fitted to this foot to relieve new strains developing from unavoidable slight changes occurring in anatomic relations after the injury. This plate will be worn until new compensatory changes in bones, ligaments and muscles can take place slowly and until a new normal balance is thus established.

(D) Figs. 52 and 53 show the pronated feet of a middle-aged patient with cardio-renal trouble. The ankles of this individual frequently become edematous and circulatory disturbances aggravate tendencies toward pronation of the feet. Low flat plates were fitted successfully almost immediately when advice was sought, because of the chronicity of the cardio-renal trouble with the probability in consequence of continued foot weakness.

(E) Hallux valgus deformities are represented in Figs. 55, 56, 57 and 58. This topic is more or less concerned with foot plates, and it also is a common defect that cannot be dismissed without brief mention of advantages and limitations of operative measures. A young man of thirty wears shoes of good shape and size, yet shows symptomless hallux valgus in his left foot. Fig. 55. The right foot is seen in Fig. 54 with very little deformity. There have been no symptoms complained of and also there is no bursitis over the great toe. He can work regularly without any difficulty and is ordinarily

41 42 43 and 44 45 46

47 48 and 49 50

active on his feet in spite of the anatomic defect. He was told there was no urgency in his case if he didn't desire to have surgical treatment now; and that he could safely wait until the foot troubled him.

A middle-aged woman had feet with painful bunions, the latter being of several years' continuous duration and they had resisted protracted treatment with the usual bunion pads. The feet are shown in Figs. 57 and 58. She was advised that she should have an operation immediately to straighten the toes and have the bursae surgically treated at the same time; but that afterwards she might need plates to hold the anterior arches of the feet properly if heads of first metatarsal bones were removed. Long duration of symptoms was the deciding factor in this instance.

Fig. 56 shows a hallux valgus condition in a patient suffering with arthritis deformans (atrophic arthritis, rheumatoid arthritis). This foot, and left one of the same individual, Fig. 47, were operated on eight years ago and both great toes were straightened. Further slow contractures of muscles resulted, however, in considerable recurrence of the original deformity, yet this patient is convinced that the operation was a distinct benefit because there has been less pain in the feet since; and she can walk fairly well now with plates in spite of the deformity.

(F) Finally, relations between poor postures and foot strains deserve notice. Persons with drooping shoulders, relaxed back muscles and prominent abdomens frequently complain of foot pains as well as back aches. Such relaxed postures tend to make individuals stand with thighs rotated outwardly slightly more than usual, and with toes in consequence pointing outward to undesirable degrees.

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Toeing outward shifts the pressure of body weight upon the feet inward toward their inner edges and increases the strain upon longitudinal arches, with the result that painful symptoms at times develop.

Another good explanation for associations of foot strains with faulty postures lies in the reasonable assumption that circulating blood of poor quality affects muscles and ligaments of feet the same as it does back muscles and ligaments, and that parts which happen to be the weakest succumb first. Clinical observations harmonize with this view, and there are instances in which foot symptoms are followed by back involvements, or vice versa, back aches followed by foot pains, according as muscles in the one locality are more or less resistant than muscles of the other part; also of back aches or foot strains occurring independently of each other when backs and feet show still greater relative differences in their healthy vitalities. Both explanations should be accepted, and in the case figured in 59, 60, 61, 62 local supports, exercises, and medicinal tonics were prescribed.

The patient is a middle-aged woman who has complained of back weakness for many years, and recently this abruptly increased, while simultaneously foot strain was noticed. The spinal-abdominal support figured in 59 felt very comfortable when it was fitted and relieved back weakness immediately. The feet were made comfortable with temporary strappings, and tonic-eliminative drugs were administered. Within a few weeks foot-strain passed away and the back felt the best it had for years. It will be noticed in the photographs that the back support probably does not change the positions of abdominal organs very much, and it happens also there has been relief of foot symptoms without great change in the habitual position of the feet, so that the second explanation given above appears in this case perhaps more important than the first mentioned one. The outwardly turned foot of the

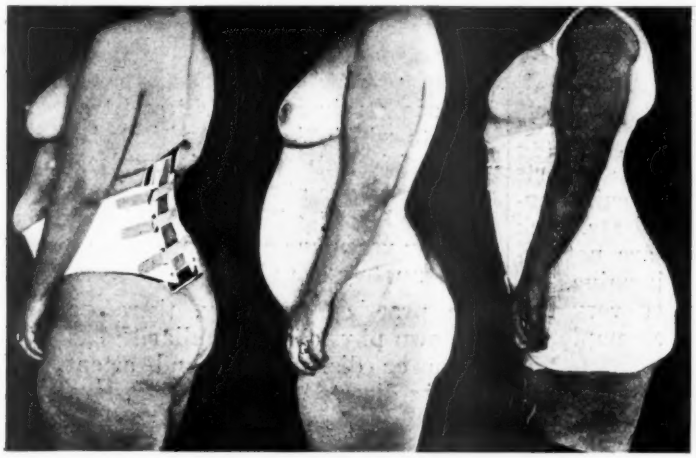
patient is shown in Fig. 62. Fig. 61 shows the patient's appearance with usual corsets previously worn readjusted over with brace pictured in Fig. 59. In all simple relaxations and strains of the feet, examinations of postures therefore should be made and treatments prescribed for backs when necessary on account of etiological relationships existing between them and foot defects.

MISCELLANEOUS LESIONS CONFUSED OR ASSOCIATED WITH FOOT STRAIN.

(A) Spurs of the os calcis sometimes are accompanied with painful symptoms, as is well known, and may be confused or associated with static foot strains. Fig. 64 shows a spur of considerable size without symptoms in a healthy man of forty-one years. This patient had his foot injured in an automobile accident, and the x-ray incidentally revealed the peculiarity in the heel, but there was no tenderness upon pressure over the projection. Fig. 63 shows a heel with less bony change at insertions of plantar fascia and of the tendo Achillis. These have been accompanied by painful heel symptoms of mild degree for two years continuously. The patient is a rather heavy woman of fifty years and she has worn arch supports without benefit. Operation was advised immediately in the latter instance and delayed in the first one until pathological symptoms make their appearance.

(B) Figs. 65, 66, 67 deal with hypertrophic bone changes in the first metatarso-phalangeal joint of a middle-aged woman. She had worn tight shoes for many years, and without apparent cause the left foot gradually became sore in a small spot between the first and second toes. The condition was first thought to be a simple anterior arch strain, but x-rays revealed bony changes shown in the illustration. See semi-circular space of Fig. 67. Palpation also showed a small tender indurated lump concealed between the toes in a location corresponding to the bony lesion. Small felt pads placed below and between the toes protected the tender region, and broader shoes were recommended. The front of the foot was snugly strapped meanwhile until it became slowly accustomed to the increased space, for the patient was quite helpless and unable to walk barefoot, on account of increased pain when the foot was not supported. Fig. 65 shows the x-ray of the corresponding joint of the normal right foot, and Fig. 67 is a photograph of the affected left one. The nature of this pathological process is very obscure, but undoubtedly continual wear of tight shoes furnish an important mechanical element, and there may be some infectious factor, as the tender indurated lump in the soft tissues suggests.

(C) Locations of infectious processes vary, as is illustrated by the feet figured in 68 and 69. The right one is symptomless, but the second metatarso-phalangeal joint of left one has been nearly rigid



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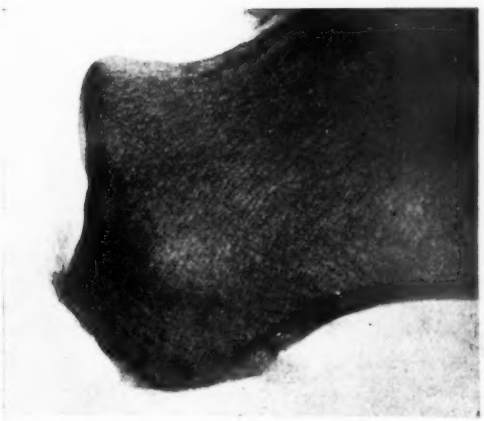

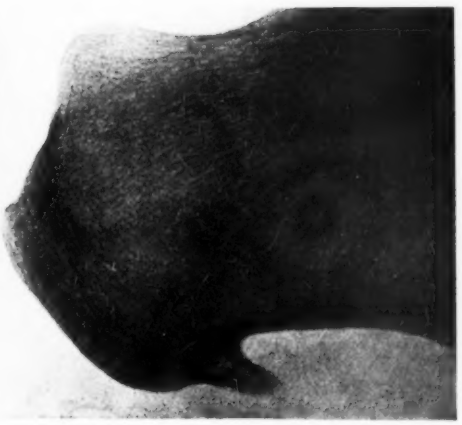

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for several years, and the patient has recently had pains in the front part of this foot and calf of the leg. Plausible etiologic factors in this case are many carious teeth, since painful symptoms have subsided after dental care combined with local mechanical supports, and the stiff toe has become somewhat more movable.

(D) Skin lesions have to be mentioned as being confused by patients with pains of foot strains. Burning sensations associated with chronic inflammatory processes in the skin frequently are thought to be flat foot and also the painful pressure of calluses is sometimes attributed to foot strain. Fig. 70 shows an extensive callus of the front part of the foot protected by an adjustable leather cuff with attached felt pads to take the pressure off tender areas at heads of metatarsal bones.

DISCUSSION AND CONCLUSIONS.

Data enough have been given to indicate numerous details which must be memorized by the thorough practitioner, since any of them are liable to enter into the next case presented.

Errors commonly observed are those of patients or physicians who conclude, for example, that flexible shoes are harmful because some persons are made worse after their use while other patients are benefited by use of foot supports; or oppositely, that plates are bad because they do not relieve some individuals who are helped by exercises. Mistakes in these instances consist in comparing things which are unlike each other, and instead successes of one method logically should be compared with successes of the other, also failures with other failures. In addition, it is unjustifiable to compare supports with exercises because they are physiological opposites. They complement, not duplicate, each other's action in treatment. They are not antagonistic to each other, as some imagine, because different; and both are needed very frequently before normal functions are completely restored.

Another common error is to place so much emphasis on certain features, broad toed shoes and low heels, for illustration, that other facts are obscured which should enter into consideration. There can be no doubt that broad toes and low heels are ideal styles for persons who have never worn shoes; but in fairness it must be admitted that the majority of women still wear moderately high heels and shoes without extreme toes. They do this with less discomfort perhaps than the smaller group of women who are obliged from foot strain to wear more correct styles. Considerable maltreatment is compatible with continuance of normal foot functions in the large majority of persons, because compensating functional changes occur which offset slightly unfavorable conditions imposed by faulty foot wear. Eventually such defective conditions slowly become more comfortable and normal than original ones, when bones, muscles, and ligaments have accommodated themselves long enough. Efficiencies of the feet are lowered somewhat by these changes, yet they are good enough still for all practical uses; so that we should hesitate about making too radical changes in long accustomed styles of foot-wear of persons of middle age and past, when their foot symptoms are not very severe nor of long duration.

Misconceptions of the relative importance of anatomic and physiologic foot peculiarities perhaps are commonest and most important errors encountered. Anatomic peculiarities can be recognised at a glance, or if hidden, they are convincingly revealed in x-rays. Physiologic peculiarities on the other hand cannot be estimated readily, namely, the healthy vitalities of synovial and subcutaneous tissues, cartilage, bone and fasciae, as these various tissues resist mechanical frictions, strains, heat, cold and traumatic influences to which they are subjected. Physiologic peculiarities, strengths of muscles, tissue resistances, etc., are all dependent closely upon variable conditions of blood and lymph, but variations in vascular proportions from time to time unfortunately are almost entirely unknown.

In practice, naturally, therefore, intangible unknown physiologic peculiarities are easily forgotten or disregarded, and attention instead soon is directed entirely to easily understood structural variations. This error is of fundamental importance, having direct bearing on surgical procedures, internal medical treatments and orthopedic appliances. It creates strong tendencies toward unnecessary fitting of mechanical braces, toward too much surgery, and toward

65 66 67 68 69 70

over-estimation of the importance of anatomical features with corresponding underestimations of functional aspects of each problem.

Correct conceptions recognize complementary natures of anatomic and physiologic factors, that they are combined always with each other to produce the balance of health, and that they give rise to widely variable degrees of good health and ill health. Average good health always is a matter of balance between the two, and is possible with marked structural variations in the feet amounting even to deformities, provided there are also compensatory strengthenings and functional changes in foot muscles and ligaments. Figs. 63 and 64 prove conclusively that anatomic variations independently furnish no reliable indications of pathologic symptoms. In Fig. 64 the greater structural peculiarity is unassociated with symptoms, while the slight one in 63 has been accompanied by continuous tenderness and pain for many months. This does not contradict the statement, however, that the greater the anatomic defects are, the more severe will be the pathological symptoms produced, other things being equal. The truth simply remains that these other things vary so much in such subtle unrecognized ways that anatomic defects alone become unreliable indicators of symptoms.

The problem of what shall be done with obscure functional factors, which cannot be measured, yet which are so important because ever-present, has to be solved by indirect means except in a few instances where direct measurements are possible, as with muscle strengths. Osgood* and others have shown that measurable changes in muscle strengths do occur, that in foot strain there are relative weaknesses in muscle groups acting as foot adductors; but these interesting observations are about the only important physiologic studies that have been made upon feet.

All physiologic peculiarities, including muscular ones, can be treated and roughly diagnosed at the same time, however, from results of treatment, when hygienic regulations and drugs are tried in therapeutic-diagnostic ways; for, despite the impossibility of determining functional peculiarities or vascular proportions directly, yet pharmacology and human physiology respectively indicate physiologic action of drugs, and relations between organs. It is very simple to administer a few selected reliable medicines of well-known action in routine manner, and to stimulate well recognized physiologic activities of different organs, thus eliminating from circulation accumulated waste products and other unknowns which cannot be clinically identified; and when the blood has been kept in good condition continuously for a few weeks the tissues begin to respond noticeably to their improved environment and pathologic symptoms begin to abate.

* See Bibliography.

Details of drug administration cannot be entered upon in this paper, but practically it has been found that simple tonic-eliminative measures accelerate relief of many foot defects, as they also do other orthopedic troubles; and foot strains should not be thought too trivial to be treated according to best medical principles, if there are to be any differences between medical care and haphazard purchases at stores of plates and shoes.

Abnormal symptoms are most reliable criteria by which to judge the lack of balance between physiologic and anatomic peculiarities. Feet should not be treated because they are flat simply, as some of our best athletes have symptomless flat foot; nor is it necessary to operate upon symptomless hallux valgus deformities or os calcis spurs because of anatomic considerations alone. Great severity or long duration of pathological symptoms occasionally present indications for immediate interference when structural defects are almost negligible, excessive use under average anatomical conditions being the principle causes in some of these instances.

Another error seen in practice in the furnishing of too much artificial support for weak feet, or giving right amounts of support for unnecessarily long times, thereby weakening muscles and ligaments from disuse.

Patients are fitted frequently with foot plates, but have no directions given them about discontinuing supports when symptoms have been relieved. Feelings of weakness noticed when plates are first removed, after having been worn for considerable periods, make such patients inclined to continue the use of plates to the detriment of the strength of their feet. This should be avoided by explanations made at the outset. An illustration has been given in the foregoing records with its natural outcome, *e.g.* the trial of flexible shoes.

Controversies have arisen over respective merits of low flat styles of plates shown in Fig. 24, and the balanced variety represented in Fig. 32, the latter being originally devised by Whitman. Both styles possess merit. Flat plates give enough support for relief in a large percentage of cases, as their successful, wide use demonstrates. They are more easily fitted than balanced types, but the latter prevent pronation and hold longitudinal arches more perfectly than low firmly set supports. Balanced types of plates can be made very comfortable, or purposely slightly uncomfortable so that they exercise foot muscles through variations in balance. Muscles will draw up inner borders of feet away from points of uncomfortable pressure of plates if the right degree of balance in the latter are secured. Balanced plates relieve successfully some very badly pronated flexible feet which cannot be held satisfactorily with other supports, but they are not entirely free from faults and may be improperly used to strain

muscles which are already overtaxed. At other times, when made with more comfortable balance, they occasionally afford really more support than is needed, and so tend to produce weakness or disuse more rapidly than less perfectly fitting flat plates.

When feet have been unnecessarily supported for long periods, plates gradually feel harder and harder as muscles functionate less and less. Flexible shoes which exercise the feet, or special foot exercises then will relieve these symptoms due to over-support. Exact degrees of artificial aid necessary from time to time will be seen to be variable quantities, depending largely upon muscle strength and muscle tone; and since muscles respond closely to variations in blood from time to time the extreme importance of keeping blood continuously at its best quality can be readily understood. In chronic debilitating diseases much artificial support is required, while in early healthy adult life none should be needed. The only fixed principle in practice with regard to supports is the one of determining and prescribing minimum amounts which are adequate for relief of symptoms in the particular stages presented. Abrupt extreme changes from very great to very little support are mistakes commonly observed, which it is hardly necessary to say should be avoided.

This paper has been prompted by the writer's experience in the Orthopedic Out-Patient Department of the Massachusetts General Hospital. To this clinic come great numbers of patients with foot troubles, who exhibit widest varieties of conditions, and among whom previous treatments have been variously good, bad, or indifferent. There are neglected cases and over-treated ones, selfdirected cases, cases treated by so-called "foot-specialists," connected with shoe stores, and patients who have been in the care of medical practitioners. Efforts are being made continually by members of the clinic toward improving the efficiency of the department as much as possible under the imposed circumstances of limited time and many patients; and it was from study of the great variety of conditions exhibited in this wealth of clinical material that conclusions and general principles herein presented have been largely drawn, which are applicable in general practice.

GENERAL CONCLUSIONS AND PRINCIPLES OF TREATMENT.

1. Avoid routine use of any single special method.

2. As a starting point, observe the kind of shoes worn; pathological signs and symptoms in the feet; the amount of use of the feet demanded; the state of health and its recent changes; the past history and treatments; and then, proceed *gradually* to make necessary alterations and prescriptions in careful manner.

3. Remember that treatments have to be ended skillfully as well as begun properly, and accordingly discontinue the use of plates, straps, medicines, etc., at best times.

4. In simple relaxations and strains, or in rigid flat foot, support the feet with adhesive straps at the outset and simultaneously prescribe suitable tonic-eliminative drugs. Later, from responses to those two measures, and after taking into consideration all circumstances and social conditions of patients, continue with strappings, make changes in shoes, fit plates, prescribe special foot exercises, or suggest ether manipulations, plaster casts, etc., as seems best according to physiological requirements of each successive situation.

5. Do not exaggerate the importance of easily recognized anatomic defects nor underestimate equal values of obscure physiologic peculiarities. Remember that all patients have vascular systems; that possibilities of blood variations have to be dealt with in all cases, and many times are only ways of attacking physiologic defects, furthermore, that regulations of vascular defects sometimes are simple although defects themselves are complicated or unknown.

6. Avoid unnecessary surgery, and too much treatment with orthopedic appliances, by taking into account first always the severity and duration of abnormal symptoms; and by remembering that pronounced anatomic peculiarities often are compatible with continued normal physiologic activities.

7. Treat special foot diseases in appropriate special ways.

8. Whenever there are recurrences in underlying causes of foot strains, or other defects, as quite commonly happens at irregular intervals, there are likely to be recurrences also of pathological foot symptoms. These must be expected in some instances, and decisions made then between repetitions of former successful methods and trials of novelties of uncertain merit. Much can be said in favor of adhering to well-tested efficient methods in preference to experimenting too quickly with doubtful new variations. Patients ought to understand the situation.

9. Explain to patients the limitations and possibilities of comprehenisve methods and of single special ones sufficiently for them to understand the necessity of the former for best results, although they may be complicated and include a number of different stages. Demonstrate the inadequacy of any single method of treatment, old or new, in fulfilling the various requirements, likely to be met, and which shift from time to time in the same person. Make it clear that these common and comparatively trivial foot troubles require nearly as comprehensive understanding for their *skilful* treatment as serious orthopedic conditions in other parts.

* Osgood, R. B.: The Treatment of Faulty Weight-Bearing in "Weak" and "Flat" Feet. Am. Jour. of Ortho. Surg., Oct., 1906.
The Comparative Strength of the Adductor and Abductor Groups in the Foot. Am. Jour. of Ortho. Surg., Jan., 1908.
Pathologic and Symptomatic Weight-bearing. A Consideration of the Prevention and Cure of Foot Strain. Am. Jour. of Ortho. Surg., Feb., 1912.
The Prevention of Foot Strain, BOSTON MED. AND SURG. JOUR., Mar. 13, 1913.

THE PROGNOSIS OF INCIPIENT SENILE CATARACT.*

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To the lay mind the diagnosis of cataract is equivalent to a sentence of certain blindness at no very distant date. Unfortunately this opinion prevails with many medical men who have not given special attention to the eye. It is the purpose of this paper to show that a much more optimistic prognosis is justifiable. The importance of correcting this misconception can hardly be over-estimated. The definition of the word in the Standard Dictionary is "an opacity of the crystalline lens of the eye or its enclosing capsule resulting in complete or partial blindness." This is certainly a terrible doom to contemplate, and in many instances has induced great despondency and even melancholia. While the definition is true of the progressive type it is not true of a very large percentage of cases, the

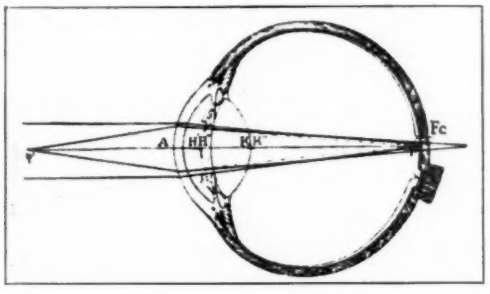


FIG. 1. (Landolt.)

Schematic eye. *o'* Anterior or first principal focus; *a*, anterior surface of the cornea; *H'* and *H''* principal points; *K'* and *K''* nodal points; *o''* posterior or second principal focus; *F.c.*, fovea centralis; *o'o''*, optic axis.

non-progressive type, for whom this is a most cruel misconception.

The eye is a most highly differentiated sense organ and the lens unlike any other tissue. It is double convex in form, 5 mm. in thickness and 9 mm. in diameter, situated just posterior to the iris, resting upon a concavity of the vitreous body. The posterior surface is slightly more curved than the anterior, but this latter has the property of increasing its convexity by the contraction of the ciliary muscle. This process is known as accommodation, and by it the eye is focused for objects at different distances. Embryology teaches us that it is entirely of epithelial origin. The anterior capsule is lined with a single layer of cubical cells which by a process of elongation grow into fibres which extend from the anterior to the posterior capsule.

In other epithelial structures the worn out cells are exfoliated; but here, as new cells are formed, the older ones are squeezed together in the centre, gradually forming a nucleus, which increases as age advances, finally forming a hard centre. The enveloping substance is called the cortex. There is no definite line of separation

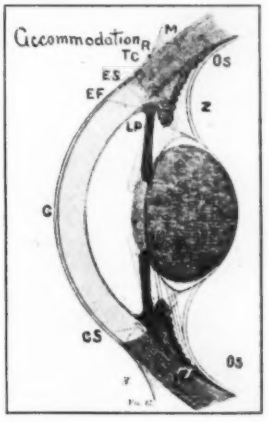
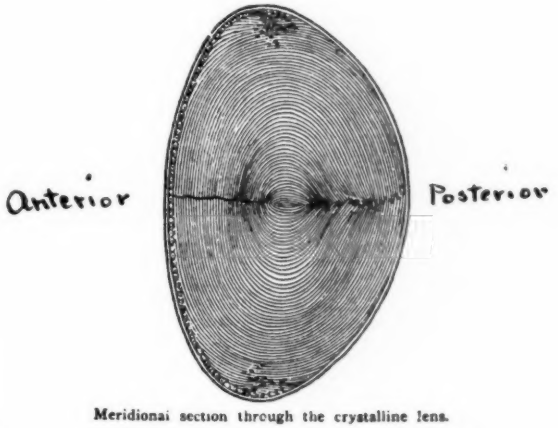


FIG. 2 (Landolt.)

Anterior portion and ciliary region of the eye. *C*, cornea; *eS*, Schlemm's canal; *Os*, ora serrata; *lp*, pectinated ligament; *eF*, Fontana's space; *T*, tendinous ring; *m*, meridional fibres; *r*, radiating fibres; *c*, circular fibres of the ciliary muscle; *z*, zone of Zinn. The full lines indicate the crystalline lens, iris, and ciliary body in a state of rest; the dotted lines show the same in a state of accommodation.

between the two, but a gradual increase in density from without inward. In elderly people the refraction of the centre is often quite different from the periphery.



Meridional section through the crystalline lens.

FIG. 3. (Henderson.)

Showing growth of lens fibres from epithelial cells lining anterior capsule, the nuclei accumulated in the equatorial zone, and lines formed by union of ends of fibres.

The lens has no blood vessels, its nutrition being secured by absorption of lymph from the ciliary processes. The metabolism is, therefore, extremely slow.

A complete enumeration of the varieties of cataract would transcend the limits of this paper, but a few must be mentioned, with no further explanation than the names imply.

Congenital and acquired.
Primary and secondary.
Hard and soft.

* Read on Oct. 7, 1915, at the monthly meeting of the Boston section of the Massachusetts Homeopathic Medical Society.

The typical senile cataract is *hard,* is *acquired* and usually *primary,* but may be secondary in the sense that it may be influenced by some other diseased condition. It is either nuclear or cortical, depending on the location of the opacity.

The nuclear variety is simply an exaggeration of the normal crowding together of the worn out cells, a strictly senile change.

Common senile cataract is an opacity of the cortex of the lens, beginning at the periphery in the form of radial streaks. These streaks look grey with oblique illumination, and show as black lines with the ophthalmoscope. If they do not extend far into the pupillary area the sight is not at all affected. Later on they may have a stellate appearance following the lines of the uniting lens fibres.

This variety of cataract is seldom seen before the 50th year, and increases in frequency with older patients, yet it cannot be regarded as a physiological senile change. Regeneration of the new cells takes place more slowly and metab-

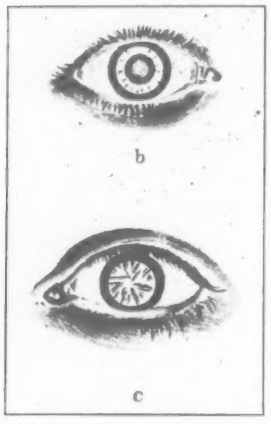


FIG. 4. (Haab.)
Ophthalmoscopic appearance with dilated pupil. *b* Zonular opacity with radial striae; *c,* Cortical opacity, immature, showing stellate figure.

olism, at all times slow, is less active. The normal sclerosing evidently predisposes to the formation of spaces between the fibres, which become filled with liquid which has a different refractive index from the fibres themselves, and thus form opacities. Fatty degeneration occurs in spots and lime salts are often deposited as the cataract matures.

If the patient be one who consults his oculist at reasonable periods, the latter will discover the trouble long before the patient is aware of it. These cases are often complicated with general faulty metabolism, and occasionally are of diabetic origin. Any disease which affects the nutrition, like glaucoma or uveitis, may be the primary cause and should receive the appropriate treatment.

Will it progress is a question no one can answer, so it is the consensus of opinion of most ophthalmologists that the patient should not be enlightened. Fuchs puts it thus, p. 415:

"No kind of medicinal treatment is effectual against cataract. . . The progress is sometimes rapid, sometimes slow, the latter especially in senile cataract, which not infrequently remains in an almost unchanged condition for years. Hence when we find in an elderly patient the

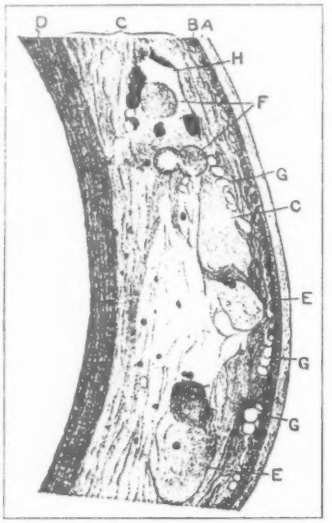


FIG. 5. (Weichselbaum.)
Microscopic section of nearly mature cataract.
a, capsule; *b,* epithelium; *c,* cortical layer; *d,* anterior portion of nucleus; *f,* spheres of fatty degeneration; *g,* vacuoles; *h,* complete liquefaction of lens substance.

first stages of a cataract, which as yet produces no interference with vision worth mentioning, the indication is, in the interest of the patient, not to frighten him by communicating the condition to him, as he may enjoy good vision for *several years to come.*"

Dr. deSchweinitz says of prognosis, p. 545:

"Incipient cataract in the form of striae in the anterior cortex need not doom the patient to rapid deterioration of sight, because the existing vision is often maintained for long periods of time. Spontaneous disappearance of senile cataract has been reported. . . Drugs do not exist which can dissolve a growing cataract."

The natural history of untreated senile cataract has, so far as the author knows, never been properly investigated. Various drugs have been advocated and each has had its vogue, but no one has yet been able to record any better success than follows the let-alone policy. In most cases the opacity is unchanged. Authentic cases of spontaneous absorption have been reported, and a certain percentage will progress to maturity. Most of the reports of success of a certain line of treatment have omitted to give the number of cases not benefited, so that nothing is proved. Cinneraria Maritima enjoyed a great reputation with the laity and some practitioners, but an investigation of the case made by the Homeopathic O. O. and L. Society some years ago showed that value was not proved.

The sub-conjunctival injection of potassium iodide was claimed to have the power of absorbing opacities. I tried this in a few cases, but

could discover no value. The x-ray flash was announced as a cure. I secured the apparatus, and with the coöperaton of Dr. B. T. Loring, tried it on a dozen cases, but was doomed to disappointment. Cures have been reported with drugs administered homeopathically, but never under conditions essential to scientific demonstration. For a number of years I have pursued the policy of "*watchful waiting,*" until it is evident that the opacity is increasing.

All cases of incipient cataracts have been indexed. From 1900 to 1915 of all private patients over fifty years of age, 23% had some demonstrable opacity in the lens, though in many cases the sight was but little if at all affected, yet by the accepted definition one must diagnose cataract. Sufficient time has now elapsed to report on those seen from 1900 to 1905. One-half had vision of .5 or better, that is, serviceable sight. Many have been watched at varying intervals for from 10 to 15 years. Of course many have been lost sight of, but as near as can be estimated not more than 1% of the truly incipient cases have matured and not more than 5% of the same have materially advanced. From this it appears that the prognosis of incipient senile cataract untreated is extremely good. Most of the cases which have come to operation have been nearly or quite mature when first seen.

Unless one can show that his results with a certain drug, internal or external, or the indicated remedy or the mechanical appliance are better than the untreated case, he has not proved the therapeutic value of his interference. Patients are so willing to be treated, especially if one uses the word cataract, that it takes some moral courage to desist. The coöperation of the family physician would greatly assist in the rational treatment of the case.

We refrain from using the word "cataract," but say truthfully "There is some slight opacity in the lens." A careful drawing is made to show size and location of the opacity for future reference. This is important, as vision may remain unchanged even with marked increase of defect. A laboratory urinalysis of a 24-hour sample is made and duplicate report sent to the family physician, who is apprized of the true condition. He is requested to go over the case carefully, and patient is advised that attention to general health will be most helpful. Any marked reduction in urea excretion is treated with high frequency auto-condensation three times a week for one month, when a second urinalysis is made to determine if excretion be increased. Refraction should be corrected frequently, as cataractous eyes are apt to undergo much change in this respect. Contrary to what some advise, the reasonable use of the eyes is encouraged, believing that if any accommodation be possible it will be beneficial—possibly improving metabolism. Eye grounds are studied and any associated disease treated, especial attention being paid to lacrimal stenosis. This must be cured before any operation be undertaken lest the wound become infected from the contents of the sac. If a few probings fail to secure drainage the sac is extirpated.

The patient is requested to return in one month for observation and if no change be discovered, he is asked to return in three months. The case is then usually lost sight of until he needs a change in glasses. A certain proportion of cases will progress. Many ophthalmologists feel that these should be treated, though few of them agree upon the indications. For a number of years I have refrained from doing so, though I should not hesitate if the patient seemed unwilling to accept my let alone advice. Unfortunately many seemingly are satisfied, but are led astray by the great claims of cataract absorbers, and are apt to return to us for the extraction, impoverished by unprincipled fakirs. The progress of an untreated case is not a gradual loss of sight, as the process may become stationary at any period. Fortunately the two eyes are seldom equally affected, so that one retains good vision while the other is maturing. So long as the better eye is sufficient for reading, it is wise to wait for maturity, because with this maturity fluid forms beneath the capsule, loosening it from the cortex, thus allowing a much cleaner extraction. Efforts to hasten maturity have been used, such as massage of the capsule through corneal incision, but are now seldom resorted to. *There need, however, be no period of blindness.* With a preliminary iridectomy and a preliminary capsulotomy the immature lens may be safely extracted. Cocaine suffices and general anesthesia is resorted to only with an extremely nervous patient. The preliminary iridectomy is done three or four weeks before extraction. It necessitates a stay of three days in the hospital, but the patient is allowed to be up and about. Although it means two operations instead of one, it greatly facilitates the major operation by affording a field clear of hemorrhage from the iris. There is also less danger of iritic adhesions to the capsule. Incidentally it teaches the patient what is expected of him, allays his apprehension, and helps the surgeon to gain his confidence. The preliminary capsulotomy is performed if the lens is immature. It consists in introducing the knife needle through the cornea and incising the capsule. The object sought is the loosening of the capsule from the cortex by allowing the aqueous to penetrate it. It is done the evening prior to the extraction.

The quack advertisement "Avoid the terrors of the knife and take my absorption treatment" does seduce many otherwise intelligent patients to waste their substance. Help us to convince these people that the "terrors" are imaginary.

The confinement in bed for three days with

both eyes bandaged is really the most uncomfortable part of the treatment. On the third day the eye is inspected and if the wound has healed, the unoperated eye is left unbandaged and the patient allowed to be up. A night nurse is always in attendance when both eyes are bandaged, but there is no restraint of the hands, as the operated eye is protected by an aluminum shield.

The statistics given by Knapp,[1] whose observations were based on a large number of cases at home and abroad, give the results as follows: "In all cases as they come, failures, 5%; moderate results, 10%; good results, 85%." It is, therefore, evident that a good prognosis is justified in the cases which advance so as to require operation. If one is losing his sight the most hopeful diagnosis is cataract. If the eye be normal in other respects, sight is usually restored.

The principal causes of failures are:

A diseased eye behind the cataract.

Infection, usually auto-infection, may occur, as it is impossible to secure perfect asepsis. Vision is usually lost, but fortunately this is extremely rare, perhaps 1 or 2%.

Post-operative hemorrhage from the retina is extremely rare but fatal to success.

Iritis, traumatic and from rheumatic diathesis, may leave a closed pupil but this can usually be remedied by a skillful Ziegler iridotomy.

Patients with incurable diabetes and nephritis are undesirable risks, but most surgeons feel it a duty to give them the chance. Naturally the statistics of a given operator will be greatly affected by the percentage of unfavorables.

CONCLUSION.

Most incipient senile cataracts never advance enough to need operation; therefore, we should avoid the term "cataract" and give the most hopeful prognosis until it is evident that it is progressive. Then, if it does mature, operation offers a good prognosis. If the sight of the better eye is insufficient for reading, the immature cataract of the more advanced eye can be safely removed, so there need be no years of partial blindness waiting for ripening. Certainly the patient is entitled to the most optimistic opinion which clinical history and experience warrant.

[1] Norris & Oliver System of Eye Diseases, p. 818.

THE RADICAL TREATMENT OF PERITONSILLAR ABSCESS BY TONSILLECTOMY DURING THE ACUTE STAGE OF THE DISEASE.*

BY HARRY A. BARNES, M. D., BOSTON.

PERITONSILLAR abscess is a suppurative inflammation of the walls of the sinus tonsillaris. As the tonsil itself is in reality only a complicated mucous membrane containing a large amount of lymphoid tissue and covering the walls of the sinus, quinsy may be considered a submucous abscess of the sinus. The pus, therefore, usually is confined between the fibrous mucosa of the sinus (the tonsillar capsule) and the muscular walls of the fauces immediately subjacent to it,—the superior constrictor of the pharynx externally, and the palato-glossus and palato-pharyngeus anteriorly and posteriorly respectively. The pus may be confined by inflammatory adhesions to a small area anywhere within this comparatively wide field; or it may dissect the capsule away from the muscles over a large portion of the sinus. As the sinus extends high into the palate, the latter type of abscess appears to be palatal in position, and may be opened and drained either through an incision in the palate, or one extending upward and outward through the superior wall of the supratonsillar fossa. Anterior and posterior abscesses, when their situation can readily be determined, are usually easily accessible by incision through the anterior pillar or between the posterior pillar and the tonsil. When, however, the pus is confined to the space between the body of the tonsil and the superior constrictor muscle, the task of reaching it by incision is not always an easy one. Every surgeon has probably had the experience of repeated failures to locate the pus in this class of case, which of all surgical affections is one of the most uncomfortable to the patient with which we have to deal. Some years ago Ballanger suggested a method by which such abscesses might readily and surely be drained with a minimum of suffering to the patient,—a capsular dissection of the tonsil backward until the abscess cavity is reached. Provided ankylosis of the jaw, nearly always present in quinsy, is not so great as to make access to the fauces difficult, this method is easily carried out and is practically sure of success. I had been using it for some time with satisfactory results, under a general ether anesthesia, when Dr. A. Coolidge, chief of the throat department of the Massachusetts General Hospital, suggested that the operation might be carried a step farther, and the tonsil then and there be dissected out completely. I confess that I was at first somewhat startled by the idea, having the old preconceived notions of the dangers of creating so large a wound in the presence of an acute streptococcus infection. On second

* Candidate's thesis for admission to the American Laryngological Association.

thought, however, I concluded that our fears on this score were not only groundless, but were without a good theoretical basis. Subsequent experience has, I think, confirmed this.

The theoretical dangers of the operation are two: First, that a general anesthesia is not safe on account of the possibility of subsequent pulmonary infection from inspired pus; second, that it is always dangerous to operate on an acute inflammation of the tonsil, at least to do so extensive an operation as a tonsillectomy, because of the fresh field opened up for infection. On the first head I can say only that I do not believe that the danger exists, beyond that which may be present in the dissection of any tonsil, provided due care is taken when the abscess cavity is reached, to prevent with gauze sponges any escape of pus below the fauces. Very large peritonsillar abscesses are not suitable for this method of treatment, both because they may easily be drained by simple incision, and because their size makes a general anesthetic inadvisable. In these the large amount of pus might be difficult to manage in such a manner as to be sure that a considerable amount did not get below the fauces. In the smaller deep-seated abscesses a sponge on the end of a holder absorbs the pus perfectly as fast as it is evacuated. I have now operated on ten cases by this method, and in none have I had reason to believe at the time of operation that any pus was inhaled, nor has there been anything in the subsequent history of these cases that would suggest it.

Of the second danger, that of infecting a large fresh wound with the streptococcus, it may be said that both theory and observation show that this method is much safer than the usual treatment by simple incision. This incision through the palate or the anterior pillar *does* open a fresh field for infection, in that in some of its course at least it goes through more or less normal tissue, where inflammatory exudate has had no chance to place a protective barrier between the streptococcus and the general system. To this also may be added the possibility of opening one of the large veins of the sinus walls by a blind incision. A fatal case of general streptococcus infection, following such an incision, occurred at the Massachusetts General Hospital last year, which I have always felt might have been due to this cause. Moreover, a fresh cut immediately closes more or less completely, so that drainage is poor, not only from the abscess cavity itself, but from the newly infected area of the incision. When the tonsil is dissected out, however, the conditions are in every way more favorable. The sinus walls are everywhere protected from absorption of the streptococcus by marked inflammatory infiltration, and the only fresh wounds made by the dissection are those through the plica anteriorly and posteriorly. It may be argued that the sinus walls everywhere are liable to injury; but if the dissection is carried out according to the description given later in this paper, there is but slight danger of this. Add to these theoretical considerations the fact that after dissection we have, instead of a closed abscess sac and a poorly drained fresh incision, a simple open ulcer the walls of which are everywhere rendered practically impervious to absorption, and it will be appreciated that this radical treatment is far less dangerous from the standpoint of streptococcus infection than the older method of simple incision.

One other point makes this method of particular value,—the abscess may be treated with success much earlier than in any other way. Peritonsillar abscess has been said not to become suppurative until the fourth or fifth day of the disease. That this is not so, anyone may convince himself by dissecting out the tonsil on the third or even the second day. He will then find that the disease becomes suppurative early, and that the reason that pus is seldom found before the fourth day is that it is too deeply seated and too small in amount to be found with any degree of certainty by the method of incision. Tonsillectomy offers a practical way of safely cutting short these most distressing inflammations early in their course. It is advisable that it be done not earlier than the third day, however, as before that time the walls of the sinus are not sufficiently infiltrated to offer a suitable defence against streptococcus infection.

The operation of tonsillectomy in these cases differs only slightly from the usual procedure by the dissection method. It is essential that the dissection be a clean one, and that the muscular walls of the sinus be as little injured as possible. If one of the larger veins is opened, it seems to me that the chances of general streptococcus infection may be distinctly increased. To avoid this, it is necessary that the field of dissection should be seen at every step. Now these tonsils are always tightly adherent to the walls of the sinus, except over the area occupied by the abscess itself. It is difficult, therefore, to find the line of demarkation between the two after the first incision in the plica has been made. The usual more or less blind evulsion of the superior lobe by blunt instruments or by probe pointed knives is dangerous, as the sinus walls are almost sure to be injured. To insure against this, I have found a pillar retractor essential. The one I have used is not unlike Killian's retractor for the lacrimal sac, except that the handle is longer, he blade broader and thinner and the curve somewhat greater. After the first incision in the plica has been made, the retractor is inserted by an assistant under the free edge, and the plica and pillar gently pulled outward and forward. At the same time the tenaculum holding the tonsil is pulled inward, so that the line of demarkation between the capsule and the sinus wall is easily discerned at the apex of the resultant V-shaped cleft between the two tissues. The lightest touch of a sharp knife serves to deepen and widen this cleft, which is in this manner extended backward until the abscess cavity is

reached. A gauze sponge on a holder is then inserted against the incision and the abscess cavity allowed gradually to empty itself. If there is a large amount of pus, several sponges may be required to absorb it. This, however, causes no embarrassment, as the stream may be cut off or turned on at will by the valve-like action of the plica and anterior pillar controlled by the retractor. When the pus has been completely evacuated, the dissection is again carried on as before until the tonsil is sufficiently freed to allow of the easy application of the snare.

The bleeding during this operation is surprisingly slight,—no greater, indeed, than that which occurs in the usual operation on the non-adherent tonsil.

The question of the disposition of the other tonsil is a delicate one. I have always removed it; and though cogent reasons undoubtedly might be advanced against it, I have yet to see any untoward results that would lead me to change my belief in its safety.

The results of the operation are particularly gratifying, especially to the patient. All the local symptoms subside with surprising rapidity, so that on the day following operation, the sore throat of tonsillectomy alone remains. Strangely enough, this last symptom is always quite mild on the side of the abscess, and patients invariably remark upon the fact. The lessened sensibility of the wound is probably due to the infiltrated condition of the tissues.

NOTES OF A CONFERENCE ON THE MEDICAL AND SOCIAL ASPECTS OF SYPHILIS OF THE NERVOUS SYSTEM.

HELD AT THE PSYCHOPATHIC HOSPITAL, MAY 27, 1915.

(Continued from page 960.)

VII.

THE SIGNIFICANCE OF CHANGES IN CELLULAR CONTENT OF CEREBROSPINAL FLUID IN NEURO-SYPHILIS.*

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AND

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Interne, Psychopathic Hospital.

THE cell count of the spinal fluid has been used to a great extent in studying cases of syphilis of the central nervous system, especially in the matters of differential diagnosis and in estimating the results of antisyphilitic therapy. Prognostic importance has been assigned to the count by many investigators when subjecting patients to treatment by mercury, salvarsan or salvarsanized serum, that is, in general it has seemed a hopeful sign when the cell count has dropped. For this reason it seems well to consider the variation in the count in untreated as well as in treated cases. Mitchell, Darling and Newcomb published a study of the cell count in a group of paretic patients in the *Journal of Nervous and Mental Diseases* (November, 1914), showing that there was a general, though not absolute, tendency for the cell count to fall toward the termination of the disease in death.

The present study consists in interval cell counts in cases diagnosed as general paresis or cerebrospinal syphilis (assuming that it is not always possible to make the differential diagnosis) in a series of 46 cases. Treatment consisting of mercury, salvarsan intravenously and potassium iodide was given in 19, the other 27 cases receiving no treatment. The counts were made at varying intervals, some short and some longer. The counts were made in the cell chamber of Fuchs-Rosenthal, staining with Unna's polychrome methylene blue in the pipette. Other tests were also performed on these fluids, to wit: Nonne-Apelt test for globulin, Mestrezat test for albumin, Lange's gold sol test, and the Wassermann reaction.

Before considering the actual findings it may be well to speak of the meaning of a pleocytosis. It seems safe to state that the cells in the spinal fluid came from either the meninges, the perivascular or perilymphatic spaces (the probabilities being that it is chiefly from the former). It does not behoove us to consider whether these cells are derived originally from the blood stream entirely or from the vessel wall or meninges; it is sufficient to know that their presence in the fluid speaks for their presence in these places. It is not known what causes them to be cast off into the fluid. As a general rule the exudation of cells is greater in cerebrospinal syphilis than in general paresis, as is seen histologically, but this does not necessarily mean that they are to be found in greater number in the fluid, for there are undoubted cases of paresis showing high counts, and cases of cerebrospinal syphilis showing comparatively low counts. Thus in one case of cerebrospinal syphilis confirmed histopathologically, the count was 109 per c.mm., while in a case of general paresis at one time the count was 310 (Case 3), and in another case diagnosed cerebrospinal syphilis on account of the clearing up of the fluid under mercurial therapy the highest count before and during treatment was 92 per c.mm. It is seen also that the number of cells may jump from 92 to 261 and again fall without treatment (M. M., No. I, 23), and from 80 to 332 (T. F., No. II, 7). From these facts it is seen that the cell count has

* Being S. I. B. Contribution whole number 128 (1915.31). *(Bibliographical Note.*—The previous contribution was by Harry C. Solomon, H. O. Koefod and E. S. Welles, entitled "Diagnostic Value of Lange's Gold Sol Test," BOSTON MEDICAL AND SURGICAL JOURNAL, Dec. 23, 1915, Vol. clxxiii, No. 26, p. 959.

no distinct importance in the differentiation of cerebrospinal syphilis and general paresis.

The report of Mitchell and his co-workers above mentioned, suggests the problem of judging the age of the process or the approach of the terminal stage. Our material consisted for the most part of comparatively early cases, but in these there was so great a variation in the number of cells found in different cases without regard to the stage of the disease that it seemed that no conclusions could be drawn in this question. But from our pathological knowledge we know that cases of "galloping paresis" may show considerable infiltration and comparatively low count in the fluid, and further that slow chronic cases may at any time show active manifestations pointing to marked increase in the meningitis and perivascular infiltration. Further, it must be remembered that some cases in which the inflammatory process is slight, but the parenchymatous degeneration progressive, may go for a long period of years without much change in symptoms and a low count, as shown in the case of G. R. (see below). It is more probably true that the cell count is some indication of the amount of inflammatory reaction present, and thus only in a slight measure an index of the severity of the process, and in very little degree of prognostic value, for in paresis the important changes are of an atrophic nature in the parenchymatous structure.*

Alzheimer has suggested that the paretic process is best indicated by the amount of dementia and that the irritative phenomena, excitements, etc., are an indication of the amount of inflammatory reaction present, and that remissions indicate a partial cessation of the inflammatory process, but in no way an index of the amount of atrophy. If this is so, one would expect a comparatively low count in the remissions. This is not borne out by our meagre figures on the cases showing remissions. On the other hand, the amount of excitement in no way parallels the cell count.

The following tables indicate the data from which our conclusions are drawn:

TABLE I.

CASES HAVING RECEIVED TREATMENT.

A. General Paresis.

CASE 1. J. S. (3998).

Dec. 18, 1914,	16	3 intravenous injections neosalvarsan.
Jan. 6, 1915,	14	2 intravenous injections neosalvarsan.
Jan. 13, 1915,	3	2 intravenous injections neosalvarsan.
Jan. 31, 1915,	4	3 intravenous injections salvarsan.
Mar. 4, 1915.	3	4 intravenous injections salvarsan.

During treatment patient became more demented and finally bedridden, due to weakness of legs. No change in Wassermann reaction, globulin or albumin content of fluid, or gold sol.

CASE 2. A. D. (3627)

June 24, 1914,	41	11 intravenous injections salvalsan.
Oct. 6, 1914,	149	15 grs. mercury salicylate intramuscularly.
Nov. 11, 1914,	82	
Dec. 12, 1914,	157	
Jan. 9, 1915,	41	

Patient slightly more aphasic, otherwise condition practically unchanged. No change in other spinal fluid tests.

CASE 3. W. R. (1659).

Sept. 15, 1913,	165	
Oct. 25, 1913,	310	3 intravenous and 3 intraspinal treatments.
Jan. 31, 1914	11	1 intravenous and 1 intraspinal treatment.
Feb. 3, 1914,	25	2 intravenous and 2 intraspinal treatments.
Mar. 27, 1914,	77	1 intravenous treatment.
April 4, 1914,	23	3 intravenous treatments.
May 14, 1914,	25	17 intravenous treatments, last treatment July 25, 1915.
Dec. 1, 1914,	30	
May 23, 1915,	41	

Patient became progressively worse. No change in other spinal fluid tests.

CASE 4. F. L. (4161).

Jan. 13, 1915,	80	No treatment.
Feb. 3, 1915,	124	3 intravenous injections salvarsan.
Mar. 12, 1915,	92	4 intravenous injections salvarsan.
April 3, 1915,	37	2 grs. mercury salicylate intramuscularly.
April 21, 1915,	22	

Patient showed remission of mental symptoms; no changes in spinal fluid except cell count. Patient at first much agitated and quite active, with marked tremors and unsteadiness, these symptoms becoming less as cell count fell.

CASE 5. F. A. (4098).

Jan. 6, 1915.	130	2 intravenous injections neosalvarsan.
Jan. 17, 1915,	56	1 intravenous injection neosalvarsan.
Jan. 31, 1915,	15	2 intravenous injections salvarsan.
Mar. 4, 1915,	8	1 gr. mercury salicylate intramuscularly.
April 7, 1915,	6	9 intravenous injections salvarsan.

Patient showed remission of mental symptoms, but no change in spinal fluid except cell count.

* It may be added here that Head and Fearnside, Fildes and McIntosh state that the reaction of the spinal fluid is an indication more of the conditions existing in the spinal cord region than in the cranial cavity, which, if true, would mean that the cell count has little or no prognostic value in paresis.

During time the cell count was high, patient was very excited and in a manic condition; these symptoms of mania subsiding synchronously with fall in cell count.

CASE 6. J. M. (4453).

Mar. 6, 1915,	42	3 intravenous injections salvarsan.
Mar. 24, 1915,	23	2 intravenous injections salvarsan.
Mar. 31, 1915,	12	4 intravenous injections salvarsan.
April 14, 1915,	14	
April 21, 1915,	10	1 intravenous injection salvarsan.
April 24, 1915,	7	1 intravenous injection salvarsan.
May 1, 1915,	9	2 intravenous injections salvarsan.
May 5, 1915,	7	1 intravenous injection salvarsan.
May 15, 1915,	3	No treatment.
June 23, 1915,	20	5 intravenous injections salvarsan.
July 10, 1915,	26	7 intravenous injections salvarsan.
Aug. 10, 1915.	150	4 intravenous injections salvarsan.
Sept. 2, 1915,	200	

Patient continues in maniacal condition. No changes in spinal fluid findings other than in cell count. Note rise in count during treatment. Physical and mental condition worse.

CASE 7. L. Mc. (2758).

June 13, 1914,	8	6 intravenous injections salvarsan.
July 1, 1914,	25	

Patient showed practically no mental symptoms. No change in fluid other than cell count.

CASE 8. W. D. (2509).

April 28, 1914,	121	
June 30, 1914,	140	3 intravenous injections salvarsan.
July 20, 1914,	30	

During interval in which cell count rose from 121 to 140, patient's condition changed from marked excitement to mental normality. Fluid showed no changes other than cell count.

CASE 9. A.D. (4383).

Jan. 17, 1914,	82	
April 20, 1914,	225	2 intravenous injections salvarsan.
April 31, 1914,	37	
April 3, 1915,	158	
May 25, 1915,	63	

During these 16 months, patient's condition showed slight increase in dementia; no other changes. No spinal fluid changes other than cell count. Note rise in count after cessation of treatment, followed by fall.

CASE 10. M. K. (4054).

April 15, 1915,	80	
April 24, 1915,	61	1 intravenous injection salvarsan.
May 1, 1915,	37	1 intravenous injection salvarsan.
May 5, 1915,	14	3 intravenous injections salvarsan.
May 26, 1915,	5	2 intravenous injections salvarsan.
June 5, 1915,	6	

No change in other findings. Clinical improvement.

CASE 11. A. McL. (4733).

April 28, 1915,	88	Intramuscular injections mercury twice a week.
April 1915,	112	
May 3, 1915,	53	

No change in other findings.

CASE 12. D. S. (4884).

May 24, 1915,	15	1 intravenous injection salvarsan.
May 30, 1915,	26	
June 15, 1915,	77	

Cessation of epileptiform seizures. Spinal fluid tests unchanged.

B. Juvenile Neurosyphilis.

CASE 13. G. U. (4154).

Jan. 13, 1915,	44	7 intravenous injections salvarsan.
		3 intramuscular injections mercury.
Mar. 24, 1915,	8	6 intramuscular injections mercury.
May 5, 1915,	13	7 intramuscular injections mercury.
June 5, 1915,	20	

Very little, if any, change in patient's condition. Spinal fluid findings other than cell count unchanged.

CASE 14. F. A.

April 3, 1915,	4	5 intravenous injections salvarsan.
April 28, 1915,	15	

Slight improvement in patient's condition. No change in fluid findings other than cell count.

C. Cerebrospinal Syphilis.

CASE 15. J. R. (2251).

Feb. 13, 1914,	26	3 intravenous injections salvarsan.
Mar. 27, 1914,	4	1 intraspinal injection salvarsan.
April 2, 1914,	21	3 intravenous injections salvarsan.
May 9, 1914,	4	

Clinical recovery. All signs in spinal fluid became practically normal.

CASE 16. C. S. (4508).

Mar. 22, 1915,	80	Intramuscular injections mercury.
Mar. 24, 1915,	91	
Mar. 31, 1915,	92	
April 7, 1915,	67	
May 5, 1915,	8	
June 2, 1915,	67	
Aug. 13, 1915,	5	

Clinical improvement. Spinal fluid practically normal on June 2, 1915, except for pleocytosis. Note that pleocytosis is last spinal fluid abnormality to disappear.

CASE 17. A. W. (4517).

Mar. 22, 1915,	75	1 intramuscular injection mercury.
Mar. 24, 1915	56	5 intravenous injections salvarsan.
May 1, 1915,	9	5 intravenous injections salvarsan.
May 22, 1915,	2	1 intravenous injection salvarsan.
May 26, 1915,	2	3 intravenous injections salvarsan.
June 5, 1915,	7	

During interval in which cell count dropped from 56 to 9, patient had apoplectiform seizure with hemiparesis, with marked excitement following. Since quiet. Wassermann reaction less strong than earlier.

II. UNTREATED CASES.

CASE 1. J. C. (3446).

Sept. 9, 1914,	16	
Oct. 6, 1914,	19	
Oct. 15, 1914,	28	Slow progressive dementia.
Oct. 24, 1914,	25	
May 22, 1915,	28	

CASE 2. C. C. (3931, 3868).

Dec. 2, 1914,	10	Slowly developing tabo-paresis.
Dec. 12, 1914,	12	

CASE 3. J. C. (3857).

Nov. 18, 1914,	38	
Nov. 28, 1914,	46	Marked tremor. Demented.
Dec. 9, 1914,	43	
May 24, 1915,	15	

CASE 4. F. D.

Oct. 28, 1914,	20	
Nov. 7, 1914,	25	

CASE 5. M. D. (4179, 4055).

Jan. 17, 1915,	33	
Feb. 3, 1915	25	Slowly developing tabo-paresis, advanced stage.
May 22, 1915,	9	

CASE 18. H. S. (4794, 5105).

July 6, 1915,	176	1 intravenous injection salvarsan.
July 10, 1915,	347	1 gr. mercury salicylate intramuscularly.
July 14, 1915,	69	1 intravenous injection salvarsan.
July 21, 1915,	83	3 grs. mercury salicylate intramuscularly.
July 28, 1915,	81	1 intravenous injection salvarsan.
Aug. 10, 1915,	20	1½ grs. mercury salicylate intramuscularly.
Sept. 2, 1915,	20	3 intravenous injections salvarsan.
		6 intravenous injections salvarsan.

Marked improvement.

CASE 19. P. W. (4785, 5089).

July 1, 1915,	48	1 intravenous injection salvarsan.
July 10, 1915,	45	1 intravenous injection salvarsan.
July 14, 1915,	39	2 intravenous injections salvarsan.
July 21, 1915,	34	1 intravenous injection salvarsan.
July 24, 1915,	18	1 intravenous injection salvarsan.
July 28, 1915,	18	3 intravenous injections salvarsan.
Aug. 10, 1915,	12	

Wassermann reaction negative July 28, 1915; globulin and albumin normal. Clinical improvement. Note cell count last of reactions to reach normal.

CASE 6. F. F. (4150, 4033).

Jan. 13, 1915,	127	Maniacal.
Feb. 3, 1915,	78	

CASE 7. T. F. (4528).

Mar. 24, 1915,	115	
Mar. 27, 1915,	191	Rapid dementia.
April 7, 1915,	80	
May 26, 1915,	332	

CASE 8. E. H.

Nov. 4, 1914,	99	
Nov. 11, 1914,	118	Paresis sine paresi.
Nov. 26, 1914,	92	No symptoms.

CASE 9. W. H.

Dec. 19, 1914,	153	Advanced case.
May 22, 1915,	15	

CASE 10. J. K. (3647, 3643).

Oct. 6, 1914,	47	Galloping paresis.
Oct. 17, 1914,	33	

CASE 11. H. G. (4577, 4696).

April 10, 1915,	103	Early paresis.
May 22, 1915,	97	Dementing form.
June 8, 1915,	77	

CASE 12. H. H.

Mar. 31, 1915,	151	
April 7, 1915,	102	Dementing form.
April 21, 1915,	141	

CASE 13. G. J. (4636).

April 10, 1915,	52	Terminal stage.
May 5, 1915,	28	

CASE 14. B. R. (4646).

April 15, 1915,	35	
April 24, 1915,	158	Mute. Apathetic.
May 12, 1915,	38	Dementing form.
June 23, 1915,	50	

CASE 15. G. R. (4112, 4002).

Jan. 7, 1915,	5	Chronic, slowly progressing tabo-paresis.
Jan. 9, 1915,	11	Small amounts of globulin and albumin.
Jan. 23, 1915,	6	W. R. at times negative, again positive.
Feb. 3, 1915,	7	

CASE 16. F. S. (3363).

Aug. 23, 1914,	17	Dementing form.
Oct. 17, 1914,	31	

CASE 17. W. Y. (3691, 3679).

Oct. 24, 1914,	67	
Oct. 31, 1914,	52	Maniacal—expansive.
May 26, 1915,	157	

CASE 18. P. G. (4547).

Mar. 31, 1915,	107	Bed-ridden, tabo-paresis.
April 7, 1915,	123	Late demented form.

CASE 19. J. M. (5167).

July 9, 1914,	41	
Sept. 2, 1914,	23	Dementing form.
Oct. 31, 1914,	60	

CASE 20. M. M. (3874).

Nov. 21, 1914,	92	
Dec. 5, 1914,	261	Excited, demented.
Dec. 12, 1914,	180	Found to be cerebrospinal syphilis at autopsy.

CASE 21. T. M. (3887)..

Dec. 26, 1914,	47	
Jan. 20, 1915,	58	Demented.
Jan. 27, 1915,	32	

CASE 22. M. M. (4191).

Jan. 20, 1915,	28	Demented, tabo-paresis.
Feb. 3, 1915,	18	

CASE 23. J. M. (4220).

Jan. 23, 1915,	42	
Mar. 12, 1915,	41	Demented.
Mar. 31, 1915,	41	
April 7, 1915,	28	
May 26, 1915,	17	

CASE 24. D. McC. (4336).

July 7, 1914,	60	Remission between two counts.
Feb. 13, 1915,	131	

CASE 25. C. M. (4393).

Feb. 24, 1915,	33	
Mar. 13, 1915,	32	
Mar. 24, 1915,	48	Demented form.
Mar. 31, 1915,	50	
Mar 22, 1915,	28	

CASE 26. M. O. B. (3097).

June 21, 1914,	13	Expansive.
Mar. 13, 1915,	46	

CASE 27. G. R. (4018).

Dec. 18, 1914,	47	Demented form.
Jan. 9, 1915,	84	

The following conclusions seem justified:—

1. The number of cells found in the fluid of untreated cases offers no definite information of prognostic value.

2. That one is not justified in drawing any conclusions as to whether the case is C. S. S. or G. P., nor the time the process has been active, nor the severity of it, from the cell count.

3. The cell count may vary greatly from month to month, or when the interval is but several days, while at other times it may remain very nearly the same after an interval of months.

4. Cases showing natural remissions may show no reduction in the cell count, or other spinal fluid findings.

5. Cases treated with salvarsan either intraspinously or intravenously tend to show a more or less rapid fall in the cell count. This count will as a rule remain low during treatment, but is likely to rise when treatment has been discontinued, but may rise during treatment after having first fallen.

6. Cases may show remissions during treatment and still have a pleocytosis.

7. Treated cases having the cell count fall to normal may at the same time become very much worse and develop more marked paralytic symptoms.

8. In general paresis the cell count in no way parallels the other spinal fluid findings.

9. In cases in which the *other* tests show an improvement, for instance C.S.S., the cell count also readily and early drops to normal. At times it may drop to normal before other spinal fluid tests become negative; again it may be last to reach normal.

10. The *change* in cell count seen in syphilitic disease untreated, is also found in non-syphilitic diseases, as brain tumor.

11. The cell count offers *nothing* of prognostic importance in syphilis of the nervous system, unless accompanied by improvement of the other laboratory signs.

11. The cell count is not an index to the predominance of irritative or degenerative changes.

(Series concluded in next volume.)

Society Report.

THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

MEETING OF WEDNESDAY, JUNE 2ND, 1915 AT 8 P. M.

The President, DR. JAMES C. WILSON, in the Chair.

RUPTURE OF PORTAL VEIN CAUSING INTRA-HEPATIC HEMATOMA SIMULATING RUPTURE OF A HOLLOW VISCUS.

DR. JOHN B. ROBERTS: A man who fell across a step in the street and struck the upper portion of the abdomen, suffering from great pain, was supposed to have ruptured stomach or intestine, and was operated upon by me a few weeks ago. The operation showed some free blood in the peritoneal cavity, blood in the gastrohepatic omentum and in the neighborhood of the pancreas. No bleeding point was found needing control by ligature. The abdomen was, therefore closed. Death, either from shock or ether poisoning, occurred just as the operation was completed. Post-mortem examination showed a large clot within the liver due to a rupture of one of the branches of the portal vein, or of the portal vein itself just within the capsule of the liver.

PELVIC HORSE-SHOE KIDNEY SIMULATING PERFORATIVE APPENDICITIS.

DR. JOHN B. ROBERTS: In February last, operation was performed for what was supposed to be acute perforating appendicitis with adhesion of the ruptured appendix to the anterior belly wall. The operation was done hurriedly under antiseptic treatment of the skin, and mild appendicitis found without perforation. The swelling which led to the belief that perforation with anterior adhesion of the appendix had occurred was found to be a horse-shoe kidney, the right portion of which lay immediately under the appendix across the spine near the sacral promontory. The right and left portions were connected by a fibrous band uniting the lower poles in this unusual position.

These cases and others show the value of the surgeon's doubting tendency before operating. Though no harm was done by operating, the diagnosis in both these cases was erroneous. Surgeons need a doubting mind because the tendency to jump at conclusions and hastily operate sometimes subjects patients in abdominal, fracture, and other departments of surgery to unnecessary risk.

A few instances of this kind were given to show the truth of this statement.

CERTAIN SYPHILITIC AFFECTIONS OF THE HEART AND AORTA.

DR. J. M. ANDERS: The advent of the Wassermann reaction has shown that the etiologic rôle of syphilis in diseases of the cardiovascular system has been heretofore underestimated. While I would not say with recent investigators that syphilis is the principal factor in the production of heart disease, it can be assumed that rheumatism and syphilis head the list as causes of organic injury to this organ. While the cardiac lesions caused by the spirocheta pallida are usually considered as belonging to the tertian stage of syphilis, Grassman, Brooks and other investigators have expressed the opinion that serious damage may occur as early as the forepart of the second stage. Aortic and cardiac syphilis may be the result of hereditary lues. The claim made by Landois, Citron, Hausmann, Sears and others that lues may affect the heart alone is interesting and important. In two infants who died, one at three months of inanition, the other at eight days of asphyxia, Warthin and Snyder found the spirocheta pallida in the heart muscle, while neither histological lesions nor spirochetae were found elsewhere.

Among the commonest cardio-vascular conditions due to syphilis are myocarditis, aortic regurgitation, angina pectoris, and mesaortitis often resulting in aneurysm. Mesaortitis with or without coronary changes is commonly the primary complaint in cases in which, as frequently occurs, two or more of the above named affections are found in association. That this condition is due in many cases to syphilis, has been demonstrated both by post-mortem evidence and by the results of carefully conducted therapeutic observations. The intimate connection between lues and aneurysm, well-known to the older writers has been emphasized by those of modern times. With Hausmann, however, I would caution the medical profession against regarding every case of aneurysm, even in syphilitic subjects, as due to lues. Two differentiating etiological factors are that the root of the aorta is the usual seat of luetic aneurysms, which are frequently multiple.

Syphilis is now generally regarded as an essential factor in the causation of aortic incompetency, more particularly in cases developing before the 45th year of life. As in aneurysm, a positive Wassermann reaction alone, unsupported by clinical evidence, does not warrant an assured diagnosis of lues, although it renders highly probable the existence of syphilis. On the other hand, it must be remembered that aortic incompetency in a luetic subject may be due to other causes, especially if the lesion develop after middle life.

Early involvement of the myocardium is not infrequent in the course of syphilis. Early recognition is difficult but important. The symptoms do not differ from those of myocarditis due to other infections and it has been shown that they disappear

promptly under energetic antisyphilitic treatment. Anginoid pains are occasionally present, and obliterative endarteritis implicating the coronaries and producing myocarditis may result in attacks of true angina pectoris. Although a positive or negative Wassermann test is not an absolute criterion, Brooks contends that it is better than the 70% of error based on the history or clinical findings alone.

Of angina pectoris, I have collected 270 cases from the literature, of which only 72, or 26.5%, gave evidence of syphilis. This percentage is much too small, since in 250 of the cases no mention was made of a Wassermann test. The close association of syphilis and angina is amply confirmed by modern authorities.

My discussion of the treatment of cardio-vascular syphilis will be limited to prophylaxis. Doubtless the incidence of cardio-vascular disease would be much lessened by a more systematic and vigorous treatment of luetic infection in general. Physicians should feel the serious responsibility of the treatment of early syphilis in the wisest manner possible. This is further emphasized in the hazard of administering salvarsan or neosalvarsan in the severer forms of cardio-vascular syphilis. It has been found that death, occurring suddenly or after several days from the use of these agents, is commonly due to myocardial degeneration secondary to coronary lesions.

DISCUSSION.

DR. GEORGE W. NORRIS: I agree with Dr. Anders that since the discovery of the spirocheta pallida and our knowledge of the Wassermann test we have learned to recognize a number of lesions definitely syphilitic which in the past we barely suspected. In the last year more attention has been given to syphilitic nephritis, and it is somewhat comforting to know that if we do give mercury or salvarsan to these patients, we are likely to benefit their nephritis rather than to injure the kidneys. One point to which I would allude, emphasized by Dr. Anders, is the frequency with which sudden death may occur in syphilitic myocarditis. Among the symptoms which have struck me as having some guiding value are low pressure, mild anginoid attacks associated with dilatation of the left ventricle, and, as Dr. Anders has emphasized, cardiac irregularity followed by auricular fibrillation. In such cases salvarsan must not be administered without due consideration. I am particularly interested also in the question of aortitis in the young. In a considerable percentage of newborn infants dying shortly after birth the presence of the spirocheta pallida has been noted in the aorta. I feel that syphilis is inadequately treated in our dispensaries. Hospitals which refuse to treat this disease in its early stages are perfectly willing to give aid when the patient returns at a practically incurable stage. It seems to me that more efficient treatment of syphilis in dispensaries is one of the crying needs of our medical work today.

DR. JAMES TYSON: In my experience as a young man in dispensary service our method of treating cases which included rheumatoid affections was to give first iodide of potassium. Failing with this we added mercurial bichloride and an astonishingly large number of cases were benefited. It would seem, therefore, that the new methods of treatment confirm the old ones. I have sometimes thought that although this was a rough and ready method of treating symptoms we might perhaps adhere to it with advantage a little more frequently than we do in modern times.

CLOSING DISCUSSION.

DR. ANDERS: I was glad to hear Dr. Norris say that we could employ salvarsan and mercury in nephritis due to syphilis. I have seen several very remarkable results in such instances from the alternate, and also from the separate use of these two agents. We must, however, be very certain that the syphilis is the real cause of the cardio-vascular and renal conditions. Mercury has its selective affinity for the kidneys, and there is no other variety of nephritis than the syphilitic in which its use is justified. While it is true that since the discovery of the Wassermann reaction the true importance of syphilis as a factor in many heart diseases has been in great part established, this cannot be said of this test in relation to angina pectoris. The close association of angina pectoris and syphilis remains to be established, according to my figures, at all events; but I believe it will be, once the profession is alive to the importance of making Wassermann tests in all cases of angina pectoris. Neglect to examine the heart systematically in the early stages of syphilis is attended with untoward results in many cases. In at least one-half of these cases symptoms arise which should arouse suspicion of cardiac involvement and lead to the most vigorous antisyphilitic treatment. In regard to cardiac involvement in the course of syphilis, the words of John Locke truly apply: "Prevention is better than cure, and far cheaper."

Harvard Medical School.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, DECEMBER 14TH, AT 8.15 O'CLOCK.

EXHIBITION OF CASE.

DR. JOHN HOMANS: An unusual case of tuberculosis of the ankle joint with marked periosteal reaction and atypical lymph nodes. Discussion by Drs. Councilman and Cushing.

PAPER OF DR. GEORGE C. SHATTUCK.

(Lady Paget Hospital.)

CLINICAL OBSERVATIONS ON TYPHUS FEVER IN SERBIA.

Among several hundred cases of infectious fever, about fifty-three were found to have true typhus fever. The following observations were based upon this series.

Among the clinical signs the rash is undoubtedly the most important. It is rarely seen on the face. Dr. Sellards, however, saw one case with an extensive eruption which covered the entire face. Within twenty-four to forty-eight hours the rash extends over the trunk and extremities. At first it is rose-

pink in color and slightly elevated, but it presses out completely. After a day or two the spots become redder, then they darken, become livid, and cease to press out completely. In the severer cases on fading they leave dark, pigmented brownish areas. In the mild cases the rash may fade before it reaches the darker, hemorrhagic form. The spots vary in size from the diameter of a pin head to that of a pea, and they have irregular faded margins.

A flushing of the face is likewise very characteristic and varies in its distribution. This later assumes a dusky, cyanotic color.

A slight stiffness of the neck is found in the majority of the cases. At times this is very pronounced. A Kernig's sign may be present on one or both sides. This is slight at times and again it is marked.

Muscle sensitiveness is quite common. The extreme sensitiveness of the calves described by many did not form a prominent feature here. Where the cases are extremely sick the whole muscular system frequently becomes sensitive.

Due to the difficulties with the language and the condition of collapse of many of the patients on admission, a perfectly satisfactory examination of the spleen was impossible. Usually the area of splenic dulness was enlarged.

The throat manifestations are very interesting. Sordes appear soon and the mouth becomes very foul. The mucous membranes of the mouth and pharynx become reddened early. As the disease advances the mucus becomes dried and more viscid.

Bronchitis is as frequent as in typhoid. On the whole the respiratory symptoms here are more prominent and severe than in typhoid. The picture may closely resemble pneumonia. In some cases the respiratory rate rises to thirty or forty. The lung signs, however, remain relatively slight as a rule. Cough is a fairly constant symptom.

Circulatory weakness is extremely common. But the pulse and the temperature show no constant relation. In the sicker cases the blood pressure drops to a low mark. The pulse pressure is then likewise low and the pulse feels weak, irregular, and thready. A dicrotic pulse was not common in this group.

As a rule the gastrointestinal symptoms are not prominent. Delirium varies in kind and in degree. Some have the low muttering type with tremor; others have delusion; and again others show the violent variety similar to the alcoholic delirium.

The three main types of typhus which were noticeable in this epidemic were:

1. *The asthenic form* in which the patient lies on his back in a semiconscious condition, breathing through his mouth. There is marked emaciation with weakness.

2. *The respiratory form.* Such patients appear to have pneumonia.

3. *The comatose form.* Coma is the prominent feature here and suggests the uremic state.

The complications are very various. In the wake of the dirty mouth a middle ear infection or parotid gland infection, or an ulcerated throat may appear. Bed sores are very difficult to avoid even with competent nursing. Abscesses are common and pneumonia is moderately common. A frequent complication of the face is herpes. Gangrene, which is rare in most infectious disease, is common in typhus. It appears especially on the nose, cheeks and feet. It is rarely seen except in cold weather.

PAPER OF DR. A. W. SELLARDS.

(Lady Paget Hospital and the Military Hospital in Belgrade.)

THE MODE OF TRANSMISSION AND THE ETIOLOGY OF TYPHUS FEVER.

One may fairly safely venture into the midst of an unknown infectious disease if certain important precautions be observed. Measures must be adopted against contact with insects and against droplet infection. The water and food supply, in addition, should be above suspicion. As a knowledge of the mode of transmission of this disease is still in dispute so far as certain details are concerned it was necessary for the members of the commission who studied in Servia to observe all of these precautions.

A one-piece garment extending from the toes to the neck with attached gloves was usually worn next to the skin. This, as a rule, was covered with the customary hospital gown and shoes. The hair was clipped short. A surgeon's cap and face mask completed the outfit. This form of dress was necessary as the great number of new patients prevented the adoption of successful measures against lice. The Austrian prisoners, however, were very conscientious in their efforts to keep the premises lousefree.

As the living quarters were clean of insects the uniforms were removed on leaving the wards. After each visit the suits were sterilized,—usually with chloroform vapor overnight.

The evidence in support of the louse mode of transmission is still incomplete in certain respects. Nicolle, Anderson and Goldberger, and Ricketts and Wilder have all satisfied themselves that the louse is capable of transmitting the disease. The critera of each set of observers, however, is not accepted by the others. Nicolle found a rise in temperature in his feeding experiments but encountered no true immunity. Ricketts and Wilder, on the other hand, saw no rise in temperature. All of their animals had immunity. They regard all monkeys as susceptible to typhus. Anderson and Goldberger found much immunity among their monkeys.

The virus of typhus, according to Nicolle, passes through a definite cycle. The louse is its host for about seven to nine days. Ricketts, however, found that subsequent to the first week after feeding lice with the virus of typhus they remained infectious as long as they lived. It is the belief of all workers in this field that the disease does not spread as a single direct transmission.

There have been a few human experiments recorded. Two of Nicolle's assistants were accidently bitten by infected lice. Neither developed typhus. Recently some notes have been published about a gardener in a foreign jail who dropped some lice infected with the disease down a prisoner's neck. In ten days the prisoner developed typhus fever.

Though the louse may furnish the common mode of transmission, other avenues of infection may exist. Droplet infection requires some further consideration.

Concerning the etiology, typhus falls among the acute exanthemata in many respects. From its clinical symptoms, typhus would not appear to be a protozoan disease.

Demonstration of scenes in Serbia with the reflectoscope.

DISCUSSION.

DR. STRONG: The most striking features of the Serbian epidemic were the high percentage of pharyngitis and laryngitis, the high percentage of the complication gangrene, and the high mortality. Three members of our commission who devoted their time to the study of the etiology of typhus in association with a worker from the British unit and one from the French unit were all unable to confirm the findings of Plotz. It has recently been confirmed that the blood of typhus patients is sterile,—a differential point from typhoid.

DR. CHRISTIAN: In America we have had some experience with typhus fever. There is a bronze tablet over a railroad bridge in Montreal which commemorates the death of several hundred people in an epidemic of this disease during its construction. Epidemics have also visited Sparrows' Point, Maryland, and New York City.

DR. F. C. SHATTUCK: Where we hear about the details of typhus from the lips of those who have just been in Serbia, it becomes clear why typhoid and typhus so often travel together.

DR. STRONG: The whole question of the etiology is still an open one. We should have a commission appointed to study typhus.

ERNEST G. GREY, M.D., *Secretary.*

RENAL PATHOLOGY AND THERAPEUSIS.*

ACIDOSIS.

DR. F. W. PEABODY. Few subjects at present are receiving more attention than that of acidosis; and its frequent occurrence in children, its great importance in diabetes and its occurrence in chronic nephritis make acidosis a subject that should be well understood. Acidosis does not mean an actual change in the reaction of the body fluids, for their reaction is remarkably constant. The mechanism to prevent acid accumulation or a change in the blood reaction acts in four different ways:

(1) The large supply of bases in the body tissues may be drawn upon.
(2) Kidney excretion *e.g.* phosphoric acid.
(3) Lungs—CO_2 is removed.
(4) Changes may take place in blood composition to neutralize acid.

If we consider the blood as a mixture of volatile and non-volatile acids with a definite limit to total acidity, it becomes plain that an increase in the amount of non-volatile acid takes place at the expense of the volatile CO_2. Thus the CO_2 the blood can carry decreases as the non-volatile acid increases and the CO_2 in the blood becomes an index of the formation of acidosis.

The dyspnoea of chronic nephritis is related to acidosis, but not solely due to it. Patients with chronic nephritis are more susceptible to CO_2 in inspired air and to other causes of dyspnoea. But the periodic respiration of advanced chronic nephritis, more or less distinctly Cheyne-Stokes in type, is probably due not to simple acidosis but to changes in the respiratory center. There is a hypo-excitability of the respiratory center, which is interrupted by periods of increased excitability.

DR. CHANNING FROTHINGHAM, JR.: The tests of renal function here considered concern themselves with the function of the removal of water salts and the products of metabolism, and not with any internal secretion which the kidney may have.

In the past various tests have been used, since to be abandoned. Among these are cryoscopy, the electrical conductive power of urine, the excretion methylene blue, rosaniline, phloridzin, lactose and KI.

At present the following tests of renal function are employed:

(a) The relation of urine output to fluid intake.
(b) Salt excretion compared with salt ingestion.
(c) Nitrogen excretion compared with nitrogen ingestion.

The above three must be studied in 24° specimens, and in (b) especially exact knowledge of the intake is requisite.

(d) The excretion both as regards promptness and amount, of six milligrams of phenolsulphonephthalein injected in solution intramuscularly. Specimens of urine taken one hour and ten minutes after the injection and then again one hour subsequently are made alkaline and their phthalein content is estimated by calorimetric means. The two-hour total is probably more important than the relation of the first and second hours' production, so that usually only one specimen is taken at the end of two hours and ten minutes. Fifty per cent. excretion is a good standard to take as a minimal normal for the two-hour specimen.

The two qualifications of this test are that it is not a good diagnostic sign in early chronic nephritis, and it may be present as the result of mere passive congestion.

(e) Incoagulable protein in the blood as shown by method of Folin and Dennis. Below 30 mg. in 100 c.c. is normal incoagulable protein. Over 50 mg. would make the prognosis grave. Between 30-50 mg. of incoagulable protein have been found in acute infections, or where chronic nephritis could not be proved, but above 30 is ordinarily pathological. High nitrogenous diet may greatly increase incoagulable protein in cases with nephritis, so patient's diet must be known.

(f) Schlayer's test, which is positive when a patient who has been on a known salt intake for four to five days fails to excrete 10 gms. of added salt in 48 hours. Frequently salt excretion doesn't increase at all. This test is positive early in the course of nephritis but doesn't increase after a certain point is reached. Experience at the Peter Bent Brigham clinic indicates that sodium retention is found in chronic nephritis generally and is not limited to one type.

(g) Monakow's test, which is positive when a patient who has been on a known diet fails to excrete 20 gms. of urea (10 gm. of added N) in 48 hours. This is not a valuable test for the early stages of the disease.

* Lectures at the Harvard Medical School on Dec. 17, 1915.

(h) Hedinger and Schlayer's test, in which on a known intake of NaCl, N and water in five known and varying meals the excretions of these substances are studied in two-hourly samples (plus one night sample). The normal kidney in these periods should excrete different amounts of urine, different amounts of salt and nitrogen and at different concentrations.

(i) The Ambard test of the concentration of salt and nitrogen in the urine of a 2° period as compared with the concentration of the same substances in the blood taken at the middle of this period. This has been worked out by McClean as a formula giving numerical index expressing the relation between the urea nitrogen and salt of the blood and urine. Van Slyke's method of determining urea with urease is the simplest way to study nitrogen excretion.

DR. HENRY A. CHRISTIAN: Tests of renal function constitute one of the most valuable procedures in the care of chronic nephritis, and certain of these tests are applicable without the complete laboratory equipment of a large hospital.

(1) Phthalein test gives valuable information and requires only a few test tubes, a 1000 c.c. flask and a hypodermic syringe. The phthalein comes in ampoules ready for injection, and one of these may easily be diluted to 50, 40, 30, 20 and 10 per cent. solutions, stoppered and kept for future calorimetric readings.

(2) The Hedinger and Schlayer diet has been modified for use at the Peter Bent Brigham Hospital. It depends on there being approximately the same amount and same sort of food each day with a known fluid intake. The amounts of fluid in each two-hour collection are important, especially the night specimen (normally about 400 c.c. on a 2000 c.c. 24° intake) and the specific gravity of the different two-hour specimens shows how promptly and how adequately the kidney can concentrate its solids.

The salt should be quantitated absolutely and by its percentage, thereby affording an idea of the kidney's ability to handle salt and of the amounts to give in the diet.

It is not worth while to quantitate the nitrogen ordinarily, for knowledge of amount and specific gravity of urine, and amount and concentration of salt give the most important data in estimating renal function.

The Management of Cases of Chronic Nephritis.

(1) Patients with hematuria should be rested in bed for two to three weeks. If hematuria does not stop, patient should get up and get some exercise to avoid loss of muscular tone and discouragement.

(2) Chronic nephritis with hypertension should always be rested to prevent cardiac decompensation. Oedematous patients also should rest.

(3) No prolonged cold baths should be taken, and especial care against chilling should be taken after two hot baths or sweats per week.

(4) The cathartics often are used too much. Oedema, and definite uremic or toxic symptoms are the only conditions calling for marked watery catharsis. Vegetable cathartics occasionally are valuable to prevent salt storage. Calomel is probably contraindicated.

(5) Presence of oedema indicates that a marked reduction should be made in fluid intake. Hypertension indicates simply that some reduction should be made. Watch the ratio, 1500 output, 2000 intake, and cut down fluids if they are not well excreted.

(6) Cut down salt in presence of oedema, or where it is inadequately excreted.

(7) Diet. Eight hundred c.c. of milk, in acute conditions, but milk is too high in protein and salts, to constitute sole diet of larger caloric value. Use starchy food instead, use one or two eggs and one slice of meat (except salt meat) at another meal, and as much vegetables as patient wants. Cut out meat and eggs one day a week, and all alcohol. Tobacco, tea and coffee may be left in.

(8) Diuretics put increased work on the kidneys, and if renal function be below a certain level, diuretics are ineffective. Oedema is the chief indication. Theocin is probably the best diuretic with a competent kidney. Caffein and theobromin-sodium-salicylate may be effective, differing often in which is the more effective. Sodium citrate is not a diuretic without water.

H. A. CHRISTIAN, M.D.,
A. GREGG, A.B.

Book Reviews.

The Clinics of John B. Murphy, M.D. At Mercy Hospital, Chicago, August and October. 1915. Published bi-monthly. Philadelphia and London: W. B. Saunders Company. 1915.

Both the August and October volumes contain an unusually large number of articles, although the volumes themselves remain the same size; it is, of course, obvious that the articles must necessarily be short. In the August number there are no less than thirty-two headings, practically every one of them including a brief description of an operative procedure. There is a series of cases illustrating surgery of the head, skull and spine, and a considerable number of fracture cases. It is impossible within the short space to enumerate even so many different headings. In the October number there are twenty-seven headings, including a talk by Dr. William B. Coley of New York City, upon carcinoma and its treatment with the mixed toxins. Dr. Murphy describes his operation for recurrent luxation of the humerus, and a large number of very complicated fractures, as well as a series of cases illustrating surgery of the chest, kidneys and the joints. The text, photographs, x-rays and cuts continue to be, as they have been in the past, interesting and suggestive.

THE BOSTON
Medical and Surgical Journal

An independently owned Journal of Medicine and Surgery, published weekly, under the direction of the Editors and an Advisory Committee, by the BOSTON MEDICAL AND SURGICAL JOURNAL SOCIETY, INC.

THURSDAY, DECEMBER 30, 1915.

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The editor will be in the editorial office daily, except Wednesday and Sunday, from one to two-thirty p. m.

Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 Massachusetts Ave., Boston. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish the first one hundred reprints for half the cost price.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

ADMISSION TO THE STATE TUBERCULOSIS SANATORIA.

IN spite of circulars of information which have been sent at various times to every physician in the commonwealth, there seems still to be considerable misunderstanding as to exactly what class of consumptives the state desires to care for in its four sanatoria.

Since its opening in 1898, the Rutland State Sanatorium has been reserved for patients in the incipient, early and favorable stages of the disease. This has not prevented in the past, nor does it prevent now, the admission of many far advanced cases whose presence helps to defeat the very purpose for which the institution was planned. The admission of such advanced cases was made easy when the filing of applications for this and the other sanatoria was given over to the medical profession of the state at large instead of being confined, as it was prior to 1910, to a small group of special examiners. In view of this condition of affairs, whereby patients who were classified as incipient on their application blanks were found to be advanced on admission, and were constantly filling up beds at the sanatorium, and also because there was nothing to prevent a patient, who might be an incipient and early case upon entrance, from remaining at the institution indefinitely until he became a far advanced and dying consumptive, the board of trustees has made two important regulations which should be clearly understood by the doctors in this commonwealth.

The first of these was to limit the residence at the Rutland Sanatorium to two years. At the end of this two years' time patients are transferred to another sanatorium or to some local hospital, or elsewhere. This has already had good results in that a fairly large number of chronic cases have been transferred to a more suitable place. It is the intention of the board to reduce this period of stay still further, probably to eighteen months or a year, it being held that if a patient cannot gain or reach an arrested condition in a year or eighteen months, his place should be given over to someone else.

In addition to this and of still greater importance, the board has passed a rule whereby every patient, favorable or unfavorable, entering the institution is placed on trial for a period of one month. If at the end of this month's period of observation he or she is found to be unfit for the purposes for which the institution was planned, the patient is removed to another sanatorium. Although this causes heartburnings on the part of certain patients, it can readily be seen that in the long run it will do much good.

So far the board has applied this rule only to patients who are physically too far advanced or too sick for the Rutland Sanatorium. It is probable, however, that in the future, as the number of local tuberculosis hospitals increases, the line will be drawn tighter and certain patients will be sent away not because they are too sick, but because they are not sick enough. There is a growing tendency in the medical profession of this state, especially in those dispensaries which are designed and planned solely for the diagnosis and treatment of tuberculosis, to advise and urge sanatorium treatment for patients who present signs not of tuberculous disease but of tuberculous infection. The difference between the two

is evident. While such a patient will undoubtedly be benefited by a stay at the sanatorium, even if his signs of active disease may be only of the slightest, it is manifestly not fair to the others urgently in need of treatment for the beds to be kept filled in this way.

The physicians in this state, therefore, are urged to remember that the waiting list for the Rutland Sanatorium is a very long one and to use every care in the selection of cases whom they recommend for this institution.

While at the other three sanatoria at North Reading, Lakeville and Westfield the admission is not by any means limited to patients in the early and incipient stages, it has been deemed advisable, as the result of the experience of the past four or five years, to decline to take patients in the far advanced and progressive stages of the disease. In the year 1910, when these three institutions were first opened, the number of beds in local tuberculosis hospitals was very small. Therefore, rather than let beds in the new institutions lie vacant, they were at once filled up with those patients for whom application was first made and who were urgently in need of treatment. This resulted in the admission of a very large number of far advanced cases and the subsequent unfortunate result that the sanatoria became known as homes for advanced consumptives. Gradually the number of beds in local tuberculosis hospitals has increased and it is hoped that the strain on our state institutions will be diminished. While, therefore, the board of trustees has no hard and fast rule in regard to the admission of far advanced consumptives and in special instances is willing to make exceptions, as a general thing it does not wish to accept this class at the sanatoria. The reasons for this are manifest. These institutions are intended and built to be sanatoria in fact as well as in name. Real sanatorium work cannot be done when the beds are filled with far advanced cases. Of still greater importance, however, is the fact that these far advanced cases in many instances leave the institution and return to their own homes to infect others at the very time when they are most urgently in need of institutional supervision. Physicians therefore are urged to use every means at their disposal to send this class of patients to local tuberculosis hospitals rather than to make application for them to enter a state sanatorium.

A NEW CONSULTATION CLINIC.

The new Consultation Clinic at the Massachusetts General Hospital, notice of which is given on the last page of this issue of the Journal, is one of the more significant medical events of recent years. Judged by conservative standards, it is an encroachment by the hospital upon the territory of individual physicians; from a more enlightened point of view, it is a further step towards improving the service which the medical profession as a whole renders the public. Whether great oaks will grow from this acorn is a matter of speculation; it may come to treating the population of cities through the medium of hospitals, which seems to us a much better solution of the problems raised by Bernard Shaw in the preface to "The Doctor's Dilemma" than would be found if medicine became a function of the state.

The theory of the clinic is to provide for people "of moderate means" a way of securing for their ills as nearly correct a diagnosis as can be reached by first-class present day methods, and to provide this without pauperizing those who take advantage of it, or forcing them to lie about their financial condition.

Any move as radical and as untried as this, is fair game for criticism, and it is, of course, probable that many of the details will require readjustment. The fee of five dollars, which it is proposed to charge, seems to many to be too small a return for the amount of investigation which will be required by some of those who apply. On the other hand, it may be that many cases sent to the hospital for diagnosis, and now admitted gratis to the regular Out-patient Department, will be honest enough, and indeed will prefer to pay the fee demanded by the afternoon clinic. The prevention of abuse of the privilege will depend upon the care with which physicians select the patients whom they refer.

One point seems clear; there can be no doubt that the Consultation Clinic will benefit the public—the people for whose advantage the profession of medicine was invented. This will not be due to successful individual diagnoses alone; it will follow, later on, that people will demand more accurate diagnoses and the application in their own cases of some of the more scientific diagnostic methods, such as they or their friends have seen employed at the hospital. In this way certain of the fatal results which we now see—the postponement of cystoscopy until the

tumor is beyond treatment, for instance—will be avoided, and the general standards of medical practice will be raised.

That the Clinic will work hardships for the general practitioner seems improbable; he will be aided in his management of the case, and if the disease is one which he is unsuited to treat, the sooner he learns that fact the better for his reputation. If, as is requested in the circular which the Massachusetts General Hospital is sending to physicians, they accompany their patients, the Clinic may come to occupy a very important place in the post-graduate education of the medical profession.

The success of the clinic will depend primarily upon the attitude assumed towards it by the general practitioners of Massachusetts. They can feel sure that the staff of the Massachusetts General Hospital will give satisfaction, and the provisions which are being made, to the end that each consultation will be answered by a personal letter from one of the men who examined the case, insure an intelligent and satisfactory response.

That the Clinic will succeed is not only our sincere wish, but our conviction. The principle is sound; we believe that physicians will be quick to appreciate its advantages, both to their patients and to themselves.

MODERN EUTHANASIA.

THE recent public outburst over a case, in which the life of a defective newborn was not prolonged by an operation for artificial anus, again brings to light the ever-increasing interest of the public in the problems centering around the control of the defective element in society; not that this interest is an entirely new one. It dates from the early Greeks, who exposed their weaklings to the elements to perish, and has come down to us, through all the many methods suggested to overcome racial weakness from overpopulation or otherwise, to the present modern desires to prevent the inception of the defective by prohibiting the mating of defectives, of requiring all prospective mates to undergo physical examination to determine their freedom from disease or defect, or in the more radical procedure of requiring the sterilization of the defective element in society. And whether it is the exposure of the weak or the sterilization of the defective, they are all euthanasic in principle, since they prevent the coming into being or the further development of human beings, only that the modern method is far more comprehensive than the ancient. The most radical methods of preventing conception are not nearly so successful as surgical sterilization. Indeed, while law prohibits disseminating this knowledge or otherwise actively aiding this end, the legal status of the surgical method of preventing conception has not yet been determined.

In spite of the universally accepted hereditary nature of most defective conditions, little is known of the method or scheme of transmission. It is for this reason that this form of euthanasia by sterilization of defectives is opposed by many scientific and race-proud people. It must be remembered that not all the offspring of known defectives are necessarily defective, nor any, indeed. Dominant and recessive qualities are not blended in the germinal cells into transitional types, and transmitting blends of commensurate inferiority, but they are grouped so that either type in general only may become patent generally, or specially only as to certain qualities. In a series of offspring resulting from the mating of dominant and recessive types, both good and bad may result, with an evolutionary tendency in the predominance of dominant types. If the number of the offspring is small, perhaps only the defective part of the series may be born. This is given as an explanation for the presence of norms or even genius in known defective families.

The question that naturally arises is whether, in sterilizing, it is right to sacrifice the lives-to-be of the possible normals in order to destroy those of the possible abnormal? Practically, this radical procedure would simmer down to the defective inmates of institutions or prisons, and would not reach the larger number of both kinds who are at large and who have, therefore, an unrestricted opportunity for propagating their kind. In some states that have passed sterilization acts, the acts have been declared unconstitutional as being "cruel and unusual punishment." Besides, these laws sanction a form of prevention of conception more radical than the usual methods which are prohibited as against public policy. To sanction this procedure in known defectives would consistently be to sanction it in individuals who, while themselves not defective, come from defective stock, or in indi-

viduals of grossly bad environment and great fecundity. The question is a new one, with scientific knowledge still meagre, and it will, therefore, perhaps be better until more is known about the ethnic tendencies of the human race, to go slowly with radical innovations. Euthanasia and eugenics, in whatever forms, are yet but ideals—perhaps only fetiches.

LIBRARY OF THE HARVARD MEDICAL SCHOOL.

The report of the librarian of the Harvard Medical School shows a commendable increase in the number of volumes, pamphlets and reprints which have been added to the school libraries. There have been purchased 105 volumes, 388 have been received as gifts and 2000 have been transferred from the Harvard College Library. These, with a number from other sources, make the total number of volumes added for the year to be 3100. Pamphlets and reprints number 11,670, and government publications number 397. The library now includes 27,000 volumes and 46,067 pamphlets. It is interesting in this connection to compare this with other medical libraries in the country. The College of Physicians of Philadelphia contains 105,540 volumes; the New York Academy of Medicine, 100,320; the Boston Medical Library, 83,107; and Johns Hopkins Hospital, 17,000. The attendance has also increased, especially at the Central Library, which now is open for five evenings each week until ten o'clock.

In addition to these volumes, the Library has been presented with a large number of interesting and valuable pictures and manuscripts. Dr. J. T. Bottomley gave several pictures of Boston physicians, and Dr. M. J. Rosenau over one hundred prints of German men of science. Dr. E. H. Bradford, besides presenting the Library with several pictures and an album of photographs of the Massachusetts V. A. A. Hospital Ship "Bay State," contributed a pamphlet by Aaron Dexter, entitled, "Account of a Locked-Jaw. Boston, 1790." A manuscript of a lecture on the "Use of Tobacco," by Benjamin Waterhouse, Cambridge, 1805, was given by Dr. Bowditch. A set of three volumes of manuscript notes of the lectures given by Dr. Francis Minot, was presented by his daughter and grandson. These manuscripts and prints are displayed in two glass cases presented by the Harvard Medical Alumni Association.

MEDICAL NOTES.

Fire in a Hospital.—The Isolation Hospital of Jersey City was seriously damaged by fire on December 15, and only by prompt action on the part of nurses were the twenty-three children who were ill in the building, taken to a place of safety. No one was hurt.

Typhus Fever in Mexico.—Report from Mexico City on December 16 states that the epidemic of typhus fever in that city, which was noted in the issue of the Journal for December 16, still continues, but that drastic measures for combating it have been undertaken by General Carranza. A special corps of sanitary police has been organized to undertake the thorough cleaning of all public and private buildings in the capitol and surrounding towns.

"Public baths and barber shops will be established and persons of unclean appearance will be forced to bathe and change their clothing. The fresh clothing will be furnished free by the government. The sale of alcoholic liquors is to be absolutely prohibited, and public places of amusement will be disinfected daily and forced to close at eleven o'clock each night. Uncleanly persons, no matter what their social class, will be denied admission to street cars or other public vehicles. Heavy penalties in fine or imprisonment are to be applied to all who fail to comply with the sanitary orders.

"Up to date thirteen cases of the fever have been registered in the American and English colonies here. Many more cases have been noted in the other foreign colonies. In the aggregate, however, the number of cases in the foreign settlements is infinitesimal compared with the Mexican cases.

"The vigorous measures of the government to combat the disease are meeting with the warm approval of the people. The army is coöperating with city officials, 400 soldiers being detailed to clean barracks, and make the posts sanitary. On Nov. 29 it was estimated there were 11,000 cases of typhus fever in the Federal district and neighboring towns. The death rate exceeded 130 persons a day."

Further report by way of Laredo, Texas, on December 18, states that the total number of cases of typhus fever during the present epidemic is estimated from 20,000 to 60,000.

Dry Street Sweeping Methods.—On December 18, the committee of public health of the New York Academy of Medicine presented a report to that body on the subject of street cleaning systems, and emphatically condemned all meth-

ods of dry sweeping on account of their danger to health. The report recommended the adoption of wet sweeping methods, with adequate flushing to keep the streets as free as possible from dust.

GOATS' MILK FOR INFANT FEEDING.—The weekly bulletin of the New York Department of Health for December 18, 1915, states that a number of medical authorities have advocated the more extensive use of goats' milk for infant feeding, the main reason being the well-known immunity of goats to tuberculosis. In some parts of Italy goats' milk is the common milk of commerce, herds of goats being driven through the streets and milked before the eyes of the customers. So far as the immunity to tuberculosis is concerned, the use of goats' milk in infant feeding is advocated, not alone because of the absence from the milk of tubercle bacilli, but because it has been thought that the milk might perhaps contain immune bodies which would show positive action in preventing tuberculosis or favorably influence the course of a tuberculous infection already established.

An interesting experiment in this connection has recently been undertaken at Sea View Hospital. A herd of twenty-six goats bred by the U. S. Department of Agriculture, mostly of Saanen and Toggenberg stock, has been placed at the disposal of the hospital by the Federal authorities. This permits of the feeding of 125 children. In order to follow the matter intelligently, Dr. E. S. McSweeny, Medical Director of Sea View Hospital, has arranged for the cooperation of the Health Department Research Laboratory. This will enable the hospital authorities to supplement their clinical observations with careful laboratory data.

The outcome of the experiment will be waited with interest. Certainly every means should be employed for reducing tuberculous infections in infancy.

MEDICAL EXAMINATION DAY.—In last week's issue of the JOURNAL we noted the occurrence of medical examination day on December 8.

Medical Examination Day met with a very hearty response on the part of the people of New York City. Although Wednesday, December 8, was designated as Medical Examination Day, many persons called at the various clinics and offices of the Department of Health on Monday and Tuesday. A large number applied for examination yesterday, and everywhere there seemed deep appreciation of the new work which the Department of Health is attempting to inaugurate.

Medical Examination Day has opened up an entirely new conception of the proper work of dispensaries. Instead of devoting most of their efforts to cure disease already established, which is, of course, their oldest and hitherto most important function, dispensaries should take a substantial part in preventive medicine by arranging conferences and medical examinations of persons who are not yet ill. In this way, they could undoubtedly detect a very large proportion of serious disorders in their incipiency, or rather, they could detect symptoms which, if allowed to progress, would lead to serious disease. The Department of Health has taken this matter up with the Associated Out-Patient Clinics of New York, and it is hoped soon to be able to announce the definite establishment of this form of preventive work.

INCREASE OF PNEUMONIA IN NEW YORK.—Figures concerning last week's deaths in New York City, compiled by the Department of Health, show that during the week just passed, 1569 deaths occurred in the city, as compared with 1409 during the corresponding week of last year. The respective rates per 1000 population are 14.10 and 13.09. "This increase," said Registrar Guilfoy, "is due principally to the heavy mortality from pneumonia and the allied diseases and appears to be associated with the blizzard. Lobar pneumonia alone not only showed an immense increase in the mortality over the corresponding week of last year, but a very decided increase over that of last week."

There were approximately 1500 new cases of pneumonia in the city last week. The contagious diseases showed practically no increase in mortality during the past week, as compared with the corresponding week of 1914.

Examined from the viewpoint of age groupings, the mortality was highest in the middle and later periods of life. The mortality of children under five was lower than during the corresponding week of last year. The difference of 1.01 in the weekly rate is equivalent to an increase of 112 deaths. The death rate for the first fifty-one weeks of 1915 is 13.56, as compared with 13.66 for the corresponding period of last year.

SEIZURE OF KIDNEY CURES.—Action against several so-called "kidney cures" has recently been taken under the Food and Drugs Act by the United States Department of Agriculture. In one case the shippers of a preparation labeled as "A Sure Cure for Bladder and Kidney Trouble" were prosecuted on the charge of falsely and fraudulently misbranding the product. They pleaded guilty and were fined $25 and costs by the court. This particular kidney "cure" was found to contain over 41% of alcohol. It was labeled "Old Jim Field's Phosphate Dill and Gin, Mankind's Greatest Friend, A Sure Cure For Bladder and Kidney Trouble. It is also a Great Aid in Case of Urinary Trouble. Allenberg & Meister, Sole Agents, Memphis, Tenn." An analysis of the product showed that it contained no material amount of either dill or phosphate.

In another case, 48 bottles of "Stuart's Buchu and Juniper Compound," prepared by the Stuart Manufacturing Company, Atlanta, Georgia, were seized. The court issued a decree of condemnation, forfeiture, and destruction on the ground that the claims upon the label were misleading, false, and fraudulent. On this label the manufacturers recommended their product as a remedy for a great variety of kidney and bladder diseases and stated that the medicine contained 16% of alcohol.

A MEMORIAL TO EUSTACHIUS.—In the issue of the *Lancet* for December 4 is contained the following account of a bronze memorial to Eustachius recently erected at the University of Bologna:

"Bartolommeo Eustachi, better known as Eustachius, was the sixteenth-century anatomist, who divides with his great rival Vesalius the post of honour as a pioneer in that *métier*. Born at San Severino in the Marches, he died in 1574 after a life-long tenure of the Chair of Anatomy in the Roman school, during which he impressed relays of pupils, Italian and foreign, as not only an inspiring exponent of the science, but as a devoted exemplar of the experimental or inductive method, and, on these lines, an enricher of its subject-matter. The monument, a *chef d'oeuvre* of the sculptor Giuseppe Tonnini, represents the stately figure of Eustachius in academic robes, delivering from his chair a lecture to his students. In his left hand he holds a human cranium, while his right rests on the plates on which is engraved the intimate structure of the ear. On either side are grouped his young listeners in attitude of rapt attention. The ornamentation above consists of surgical instruments artistically disposed, and below the inscription, from the pen of Signor Giri, professor of Latin, runs as follows:—

Bartolomaeo Eustachio
Picenti
Artis Anatomicae Lumini
Senatus Academicus
Quartis Feriis Secularibus
Anno MDCCCCXIV.

"The unveiling was preceded by a brief discourse from the Rector Magnificus, Professor Tonelli, in presence of His Excellency the Prime Minister, Signor Salandra; the Minister of Public Instruction, Signor Grippo; the Syndic, Don Prospero Colonna; the Senatus Academicus; and an effective representation of the scientific, artistic, and literary bodies of Rome."

COMPARATIVE MORTALITY IN 1849.—In a report of the New Orleans Board of Health for 1849, are noted the following comparative death rates in four large American cities in that year; Boston 22 per thousand, New York 27, Charleston, S. C., 25, and New Orleans, La., 66.

AMERICAN FIRST AID CONFERENCE.—As the result of a resolution passed by the American First Aid Conference, President Wilson has appointed the following Board of Standardization, to a study of the problems of first aid, with a view to improving the methods and equipment and to standardize them for the various industries as far as possible. The Board will report the results of its investigations at the next meeting of the conference.

Chairman.—Dr. Richard H. Harte, of Philadelphia, Pa., representing the American Surgical Association.

Secretaries.—Assistant Surgeon-General W. C. Rucker, representing the Public Health Service; Dr. J. Shelton Horsley, of Richmond, Va., representing the American Medical Association; Dr. S. C. Plummer, of Chicago, Ill., representing the American Association of Railway Surgeons; Major Robert U. Patterson, representing the War Department and the American Red Cross; Surgeon A. M. Fauntleroy, representing the Navy Department; Col. Louis A. Lagarde, U.S.A. Retired, representing the War Department; and Dr. J. P. Kaster, Topeka, Kansas, representing the Association of Railway Chief Surgeons.

The following committees are among those already appointed to coöperate with the Board of Standardization. Each State Medical Society has been invited to follow suit.

The American Medical Association (Surgical Section).—Dr. F. B. Lund, of Boston, Mass.; Dr. S. F. Mitchell, of Washington, D. C.; Dr. J. M. Wainwright, of Scranton, Pa.

The American Surgical Association.—Dr. Edward Martin, of Philadelphia, Pa.; Dr. Emmet Rixford, of San Francisco, Cal.; Dr. J. B. Blake, of Boston.

The Southern States Association of Railroad Surgeons.—Dr. Southgate Leigh, of Norfolk, Va.; Dr. Bacon Saunders, of Ft. Worth, Texas; Dr. Ambrose McCoy, of Jackson, Tenn.

District of Columbia Medical Society.—Dr. Charles S. White, of Washington; Dr. Wm. P. Reeves, of Washington; Dr. H. H. Kerr, of Washington.

Conference Board of Physicians in Industrial Practice.—Dr. John J. Moorhead, of New York City; Dr. W. Irving Clark, of Worcester, Mass.; Magnus W. Alexander, of West Lynn, Mass.

ASIATIC CHOLERA IN THE PHILIPPINES.—Report from Washington, D. C., states that before the Philippine committee of the Senate, on December 17, 1915, a surgeon of the army medical corps stated that during the past year there were 10,000 deaths from Asiatic cholera in those islands, the majority of which were due to the inefficiency of the native Filipino health officials.

PREVALENCE OF MALARIA, PELLAGRA, SMALLPOX AND TYPHOID FEVER.—The weekly report of the United States Public Health Service for December 10, 1915, states that during the month of

October there were in Mississippi 21,654 cases of malaria, 888 of pellagra, 119 of smallpox and 718 of typhoid fever. During the same period there were in Arkansas 95 cases of pellagra and 153 of typhoid. There were 49 cases of malaria and 104 of typhoid fever in California, and in Kansas 218 cases of typhoid and 83 of smallpox.

LONDON DEATH RATES IN OCTOBER.—Statistics recently published show that the total death rate of London during October, 1915, was 14.6 per 1000 inhabitants living. Among the several districts and boroughs, the highest rate was 20.3 in Finsbury, a crowded central region, and the lowest was 9.8 in Wandsworth, a populous southern suburb.

EUROPEAN WAR NOTES.

CHICAGO WARD AT AMERICAN AMBULANCE.—Report from Chicago states that at a public meeting in that city on December 16 the sum of $10,000 was raised by popular subscription to establish and maintain a Chicago ward in the American Ambulance Hospital at Neuilly, Paris.

CHOLERA IN AUSTRIA HUNGARY.—The weekly bulletin of the United States Public Health service for December 10, 1915, states that during the period of three weeks ended on September 11, there were reported in Austria 6761 cases of Asiatic cholera with 4117 deaths. During the fortnight ended October 3, there were in Hungary 561 cases with 333 deaths. A large majority of all these cases was among the civil population. Since October 2, the number of all cases has rapidly diminished. There have been only 743 cases in all Austria since that time.

WAR RELIEF FUNDS.—On Dec. 25, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	$77,413.27
Serbian Fund	58,042.07
Allied Fund	44,562.80
French Fund	32,132.82
Armenian Fund	26,447.06
Surgical Dressings Fund	16,324.00
LaFayette Fund	13,958.99
Italian Fund	13,772.02
Polish Fund	11,701.08

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH-RATE IN BOSTON.—During the week ending December 25 there were 242 deaths reported, with a rate of 16.86 per 1000 of population, as compared with 207 and a rate of 14.66 for the corresponding week of last year. A notable difference was a total of 44 deaths from pneumonia against 26 last year.

There were 40 deaths under 1 year and 76 over 60 compared respectively with the totals 35 and 70 last year.

Deaths under 1 year reported in 51 weeks from Jan. 2 to Dec. 25 were 1967 against 1954 for the corresponding period in 1914.

During the week the number of cases of the principal reportable diseases were: Diphtheria 49, scarlet fever 44, measles 51, typhoid fever 1, whooping cough 50, and tuberculosis 39. Included in the above were the following cases of non-residents: Diphtheria 10, scarlet fever 1 and tuberculosis 2.

Deaths from these diseases were: Diphtheria 4, scarlet fever 1, measles 2, whooping cough 4, and tuberculosis 18; and included in these were the following deaths of non-residents: Diphtheria 3, scarlet fever 1, and tuberculosis 1.

The total number of 1915 deaths reported to noon of Dec. 26 was 11,626 against 11,509 in the same period last year. For the balance of the year 1914 there were 322 deaths reported, making the 1914 total 11,831 and the death-rate 16.06 the lowest rate Boston ever had. If the number of deaths to complete this year's total be also 322 then the total for 1915 will be 11,948 and the death-rate 15.96,—a new low record.

FIRE IN THE MARINE HOSPITAL, CHELSEA.—A fire, which seriously alarmed patients in the Marine Hospital at Chelsea, occurred recently in a storage room of the building. The hospital was at no time in danger, but the smoke rose to the wards and 63 patients had to be moved to another part of the building in order that they might not be suffocated. The loss to the structure was not heavy, but some valuable furniture and curios belonging to Dr. Irwin, the former superintendent of the hospital, were damaged.

BOSTON VITAL STATISTICS IN NOVEMBER.—A recently published monthly bulletin of the Boston Health Department for November, 1915, contains a statement of the mortality rates of this city for that month and for the first eleven months of the year as compared with similar periods in the past.

"Figures for the first eleven months of the year indicate that the rate will be less than six per 100,000, which is probably lower than ever reached by New York, Chicago, Cleveland, Philadelphia, St. Louis, Pittsburgh or Baltimore. Boston's rate from 1906 to 1910 per 100,000 population was 16; from 1911 to 1913 it was 9.2. The figures for last year were 9.2.

"For the four weeks ending Nov. 27, Boston had 800 deaths from various causes reported, as against 848 in the corresponding period of last year. Deaths under one year in the forty-seven weeks from Jan. 2 to Nov. 27 were 1812, as against 1804 for the corresponding period of 1914. The number of deaths reported in the same period was 10,621, as compared with 10,645 for the corresponding forty-seven weeks of last year."

HOSPITAL BEQUESTS.—The will of the late Ellen Channing, of Boston, which was filed in the Norfolk probate court on Dec. 20, contains bequests of $2000 to the Channing Home, Boston, and $5000 to the Massachusetts General Hospital for the provision there of a free bed.

Scientific Meetings in New England.—During the current convocation week there have been held in New England several meetings of national scientific societies affiliated with the American Association for the Advancement of Science, which is holding its sessions at Columbus, Ohio. From December 28 to 30 the Association of American Anatomists met at New Haven, Conn., under the presidency of Prof. G. Carl Huber of the University of Michigan. In Boston, from December 27 to 30, were held the meetings of the American Physiological Society, under the presidency of Prof. Walter B. Cannon of the Harvard Medical School; the American Society of Biological Chemists, under the presidency of Professor Walter Jones of the Johns' Hopkins University; and the Society of Pharmacology and Experimental Therapeutics, under the presidency of Dr. Torald Sollman of Western Reserve Medical School.

Work of the Adams Nervine Asylum.—The recently published thirty-eighth annual report of the managers of the Adams Nervine Asylum, recording the statistics of patients treated in that institution during the past year, calls attention to the charity administered by its trustees, whose extent and purpose is perhaps little realized by physicians in Massachusetts.

This institution provides fifty beds for residents of Massachusetts, of both sexes, who are suffering from nervous troubles, who are not insane and who may reasonably expect to be benefited by residence in the institution. Alcohol and drug habitués are not desired. Sufferers from chronic organic spinal disease are so unlikely to show improvement from a few months' stay there that they are not apt to be received. Patients suffering from hysteria, psychasthenia (or neurasthenia) are received and a large number are recovered or improved during a three or four months' residence.

The most common misapprehension (and a very natural one) regarding the scope of this institution, is that insane patients are received there, or that it is a place where a compromise may be made so that a patient needing restraint may avoid being sent to an insane hospital. This is an error, for under the terms of Mr. Adams' will no insane person may be treated there. In fact, it is the only institution in the state that receives nervous patients that is prohibited from caring for the insane.

In recent years 75% of the patients have been treated without payment, or at a rate much less than cost. The remainder pay moderate sanitarium prices. The institution is not a home, nor a convalescent hospital in which patients are received to recover from operations or illness. While there are thirteen beds for men, it often happens that there are not applicants enough to keep them occupied.

Miscellany.

INCREASING COST OF DRUGS.

In the issue of the Journal for December 23, we again commented on the continuing rise in cost of a large number of standard drugs and preparations. During the past week this rise has continued, and the following report from New York on December 16 announces the highest rate on record for opium and other products.

"Notwithstanding an acknowledged decrease of 50% in the consumption of narcotics in the United States during 1915, owing to the restrictive influences of the federal Harrison Anti-Narcotic law, which went into effect March 1 last, prevailing prices for ordinary druggists' quality gum opium stand at $11 per pound, the highest figure on record.

"The upward movement in opium has become particularly pronounced of late, and the extreme levels which have been attained are primarily due to the serious Balkan complications, which prevent all shipments of Macedonian gum at a time when this market is cut off from all supplies from Turkey, that country being able to ship its goods to Germany and countries in the Teuton alliance only.

"To complicate and intensify further the general feeling of uncertainty as to this drug, it has just become known that the Turkish crop will probably be not more than fifty per cent. of the 1914 yield, which amounted to 8000 cases. The indicated yield of not more than 4000 cases of medicinal opium from Turkey will be the smallest Turkish opium crop harvested since 1907, and crop statistics indicate that only in ten years out of the past half-century have smaller crops been gathered.

"At the opening of 1915, druggists' quality gum opium in case lots was obtainable in the New York market on the basis of $9.00 per pound. A downward movement set in during March and April under inadequate absorption and heavy receipts from abroad, until a $7.50 basis was reached for the gum, $11.00 for the powdered and $11.50 for the granular. The turn in the opium situation has been reached, however, and purchases of all sorts of narcotics by the belligerents in Europe have assumed enormous proportions.

"The underlying reasons for the present base of $11.00 for medicinal gum opium is not hard to trace in view of the almost complete cessation of imports, owing to the siege of Constantinople and the shutting off of the Macedonian supplies.

"Realization on the part of all domestic handlers that the cutting off all supplies from abroad renders existing opium stocks impossible of replacement, keeps the various narcotics in a strong position, morphine sulphate being maintained at $5.50 and $5.80, morphine acetate at

$7.15, morphine alkaloid at $7.15, and morphine hydrochloride at $5.00 and $5.80, while codeine alkaloid is held at $8.60 an ounce, codeine acetate, hydrochloride and nitrate at $7.80, codeine phosphate and salicylate at $6.55, and codeine sulphate and hydrobromide at $6.95. Manufacturers of the above derivatives may again be forced to arbitrarily revise their quotations in order that they may bear their approximate proportion of cost to the newly established values of sulphate of morphine and codeine.

"According to statistics released by the Government, opium stocks in the United States are shrinking at the rate of $90,000 and $100,000 worth per month. The stock of opium containing 9 per cent. and over of morphia in our bonded warehouses on October 1, 1915, amounted to but 47,189 pounds of the value of $205,680, comparing with 67,687 pounds of the value of $293,658 on Sept. 1, 1915, and 92,997 pounds of the value of $394,088 on October 1, 1914. The imports of opium containing 9% and over of morphia for the nine months ended Oct. 1, 1915, amounted to but 298,237 pounds of the value of $1,436,816, which contrasted with 271,926 pounds of the value of $1,210,274 in the corresponding nine months of 1914, and 532,575 pounds of the value of $2,315,978 for the corresponding period in 1913. The great bulk of the gum, 262,328 pounds, was received from Turkey, only 27,253 pounds having been received from Great Britain and 8656 pounds from other countries during 1915.

Latest despatches received here from Salonica state that the prices of opium have increased considerably because the arrivals from the producing districts had been stopped for an indefinite time on account of the Bulgarians occupying the different centres of production and because such opium would now be considered the product of an enemy country. Practically all the producing centres of Macedonia have been ravaged by the Bulgarian invasion, and the sowing of seeds has not been made under normal conditions.

"Morphine and codeine, though in unabated demand from the belligerents, have not advanced commensurately with the rise in crude opium. Just how extensive this export movement in the narcotics is, it is difficult to ascertain in the absence of official statistics. The exports of crude opium to Europe in the first nine months of the 1915 calendar year, however, amounted to 34,357 pounds of the value of $176,569, against practically none in previous years.

"Manufacturers of bromide preparations have just announced advances of 90 to 100 per cent. over and above their previous quotations, owing to the continued scarcity of potash. The newly established basis for granular bromide of potash is $5.50 per pound, against a previous quotation of $2.50 per pound, while for crystallized bromide of potash $5.60 per pound is asked against a previous quotation of $2.60 per pound. The advances in other bromide preparations have amounted to from $1 to $2 per pound, the newly established price for strontium bromide being $3.50 and $3.52, against the previous quotation of $2.50, while bromide of soda was advanced to $4.50 against the previous figure of $2.50, and bromide of ammonia was raised to $4.50 per pound against the previous figure of $3 per pound. Among the other potash compounds which have been subjected to advances within the past few days are permanganate, which has been raised to $1.60 and $1.75 per pound; U. S. P. bicarbonate of potash, which was advanced from 65 cents to 70 and 75 cents per pound; and sulphide of potash, which is 2 cents higher, at 35 and 37 cents per pound. So far as first hands in potash materials are concerned the most important development was the announcement of a 5 cents advance in the contract price for chlorate of potash, following which manufacturers withdrew from the market.

"Another of the interesting phases of the general situation as regards the exportation of explosive materials has been the greatly enhanced values being asked by crushers of castor beans. Announcement of another two cents flat advance has just been made, and quotations are now given as 14¾ cents per pound for standard grades in barrels, 15 cents for 'A A' and 16 cents for 'Crystal.' Aside from the demand for castor oil as a high-class lubricant for war purposes, the factors operating for the advance have been the great diminution in shipments of the raw materials, castor seed and castor nuts, from India. Private advices received here indicate that more than twenty-two vessels out of a total of thirty sailing from Indian ports have been requisitioned by the British government. Not only does this have a vital effect on the very backbone of the domestic production of the article, but taken in conjunction with the fact that English castor oil factors have been forced to operate their plants on something like fifty per cent. of a normal schedule, it is little wonder that prices reflect the abnormality of underlying conditions."

THE CONTROL OF DIPHTHERIA.

IN the monthly bulletin of the Massachusetts State Department of Health for November, 1915, appears a leading article on the control of diphtheria, emphasizing the importance not only of prompt treatment of actual cases, but of the judicious immunization of susceptible individuals during times of epidemic. This article, after noting the fact that during the past year there have been in Massachusetts 639 deaths from diphtheria, continues as follows in descrip-

tion of the value of the Schick test in the determination of individual susceptibility to diphtheria infection:

"A new and useful aid has been put into our hands by the laboratory. It has come as the result of the studies of Professor Schick of Vienna. From a long series of experiments he has devised a simple and safe test, which shows whether a given individual is susceptible to diphtheria or not. This will be invaluable in many ways.

The results of its use are already apparent. We are now reasonably certain that 80% of the new-born, 50 to 60% of children, and 90% of the adults are naturally immune from diphtheria. This throws new light upon the spread of the disease and explains why only certain persons take diphtheria even when exposed to it. This test will show whether a person has sufficient antitoxin in his blood to overcome an infection with diphtheria bacilli.

Some of the other uses of the Schick test can be summarized as follows:

1. It will enable the practising physician to diagnose doubtful membranes of the throat.

2. It will enable us to separate the susceptible from the non-susceptible individuals who have been exposed to diphtheria.

3. It will enable us to administer antitoxin to those only who actually need it.

4. It will enable us to prevent the accidents due to serum sickness, for we can determine by the use of this test whether a larger amount of antitoxin serum would have any ill effects.

5. It will enable us to lessen the yearly expenditure for unnecessary antitoxin.

6. It will enable us, when diphtheria bacilli are demonstrated in the throat of an apparently well person, to determine whether this person is coming down with the disease or whether he is a "carrier."

It will be seen from these uses that the Schick test has the possibility of a wide range of usefulness."

In order to familiarize the profession and local health authorities with the nature of this test, Dr. Milton J. Rosenau, director of the antitoxin and vaccine laboratory of the State Department of Health, has prepared the following description of the Schick reaction, which is also published in the bulletin.

"The Schick reaction is a skin test used to determine whether the individual examined is immune or susceptible to diphtheria.

The Schick test is made by injecting a small amount of diphtheria toxin into the skin. The amount injected is one-fiftieth of a minimum lethal dose for a 250-gram guinea-pig. The injection must be made *into* and not under the skin. The toxin is diluted with salt solution so that the correct amount to be injected is contained in just 0.1 cubic centimeter. Use a good 1 cubic centimeter tuberculin syringe graduated in tenths and a fine platiniridium or steel needle. The operator should be skilled in the intracutaneous method of injecting.

If the blood of the individual tested contains diphtheria antitoxin there will be no reaction at the site of the injection, for the reason that the toxin is at once neutralized by the antitoxin. The absence of reaction, therefore, signifies the presence of antitoxin; such persons are immune to diphtheria; they may, however, become bacillus carriers. The presence of reaction indicates the absence of antitoxin; such persons are susceptible to diphtheria.

If the injection has been properly made, a small wheal-like elevation appears, which shows the distinct markings of the openings of the hair follicles. This distention persists for two or three minutes.

A *positive* reaction appears in from twenty-four to forty-eight hours, as a distinctly circumscribed area of redness and slight infiltration, which measures from 1 to 2.5 centimeters in diameter. The redness increases in intensity during the next three or four days, persists for another week, and on fading gradually gives place to a brownish pigmentation, which always shows superficial scaling. The true reaction is characteristic of the irritant action of toxin on tissue cells when there is no antitoxin to protect them. In the case of a negative reaction, which indicates an antitoxin immunity to diphtheria, the skin remains normal in appearance.

A *pseudo-reaction* is seen occasionally in older children and in adults. This is not due to the irritant action of toxin, but is an anaphylactic response of the skin to the protein substance of the diphtheria bacillus present in solution in the broth used in making the toxin. Such a reaction can also be obtained with a dilution of the autolysate of the diphtheria bacillus, in which no toxin is present. The pseudo-reaction can generally be distinguished clinically from the true reaction; it appears earlier, is less sharply circumscribed, and usually disappears in from three to four days. It is characterized by a central area of redness of varying size, surrounded by a secondary areola. On fading it leaves only a faintly pigmented area, which soon becomes invisible. It will be safer, for those insufficiently experienced, to regard pseudo-reactions as true reactions.

It is important that the toxin be kept cold (on the ice), and it should be used within seventy-two hours after the date of preparation, which is marked on the label.

Note.—The department is not yet prepared to send out the materials for the Schick test for general distribution. For the present, arrangements can be made for the application of the test through the state district health officer of any particular district."

WORK OF THE UNITED STATES PUBLIC HEALTH SERVICE.

THE recently published annual report of the Surgeon-General of the United States Public Health Service records the largest amount of work performed in the history of that organization. Since the passage of the law of 1912 the public health functions of the service have materially broadened, thereby increasing greatly its usefulness to the American people. Throughout the report the economic importance of disease prevention is made apparent to the reader.

Perhaps the most important achievement of the year was the discovery that pellagra is a deprivation disease, resulting from a faulty diet containing an excess of carbohydrates. While the final experiments which led to this discovery have only recently been completed, the conclusion itself is the culmination of investigations extending over a period of seven years. The work has consisted of epidemiological field studies, actual feeding experiments conducted at numerous places in Georgia and Mississippi, and experimental research at Spartanburg, South Carolina, and other places.

A new national quarantine station was opened at Galveston, Texas, and the control of the Boston station was transferred to the Public Health Service. A great reduction in immigration has been observed during the year, with a corresponding increase in the number of aliens certified. At the port of New York, the percentage has risen from 2.29, previous to the development of the European conflict, to 5.37 since that time; this increase largely being due to the fact that with the decreased immigration more time can be devoted to the examination. The number of cases treated at Marine Hospitals and relief stations exceeded 55,000, 15,000 of which were hospital patients, a considerable increase over previous years. The Coast Guard cutter *Androscoggin* was fitted out as a hospital ship and now affords relief to deep sea fishermen on the Banks of Newfoundland.

On the occurrence of plague at New Orleans, the first outbreak upon the Gulf seaboard, the state and local health authorities requested the Public Health Service to take charge of the situation. Extensive rat-proofing and other anti-plague measures were undertaken, resulting in the eradication of the disease from among human beings, and the practical extermination of the rodent infection.

Great reduction in the incidence of malaria was obtained in localities where surveys were conducted. Drainage projects, rice culture studies and the conditions surrounding the impounding of water for power purposes were investigated in order to eradicate as far as possible the disease in these areas. Scientific investigations of malarial infection showed that in the latitude of this country the most important agent in carrying the infection through the winter season is man, and not the infected, hibernating, Anopheles mosquitoes, as was previously supposed. From the standpoint of prevention this is a discovery of considerable value.

Studies of occupational diseases and industrial hygiene were instituted at several places during the year. A survey of the industries of Cincinnati was made to determine the cause of the prevalence of tuberculosis among industrial workers. The investigations relating to the migration of persons suffering from tuberculosis were completed. Upon the request of the health authorities of five states, the organization and operations of the respective boards of health were studied and recommendations advanced for improvement in the powers and duties of these bodies. The health organizations of several cities were likewise investigated. Investigations of the pollution of streams and the examination of shellfish were also conducted.

Trachoma was combated in the Appalachian Mountains, where it is most prevalent, over 12,000 cases being treated. Surveys in certain states during the year showed that the disease is not an uncommon infection. Rural sanitation work was conducted in six different states, and everywhere resulted in the reduction of typhoid and other communicable diseases. Public health laboratories for the prevention of the interstate spread of disease were established at Chicago, Seattle, and numerous railway centers. Additional duties have been imposed upon the Service by extension of relief benefits to the newly organized Coast Guard and the physical examination of seamen applying for the rating of "able seaman." For this reason, and because of the greatly increased health functions of the Service, an increase in the commissioned personnel is recommended. An additional building for the Hygienic Laboratory and the establishment of a National Leprosarium for the proper segregation and care of cases of leprosy are also recommended.

Correspondence.

AN ENGLISH AUTHORITY ON EPISIOTOMY.

BOSTON, Dec. 24, 1915.

Mr. Editor: In yesterday's issue of the JOURNAL, you published an interesting article by Dr. Williams on episiotomy. This operation was also discussed and recommended by Dr. John Phillips in an article in the issue of the *Lancet* for November 27, 1915. Without expressing my own opinion about the advisability or indication for this procedure, may I call your attention to the following letter upon the subject which appeared in the issue of the *Lancet* for December 4. In this letter Dr. Spencer comments in part as follows on Dr. Phillips' article and upon episiotomy as an operation.

"I hope that your readers, before performing it, will note the many opinions which have been expressed against it. Dr. Phillips says: 'Parvin was one of the earliest advocates of the operation in America.' It seems to me that in the 1905 edition of

his 'Science and Art of Obstetrics' Parvin advocates it with faint praise. This is all he says about it in ordinary type:

"'Episiotomy. If a serious tear of the perineum seems inevitable, many advise that an incision or incisions be made to prevent this accident. This practice, though generally credited to Michaelis, 1810, was recommended by Ould, 1742.'

"In small type he goes on to say:

"'Opinions differ as to the necessity for incisions, and also on the part of those who approve of the operation as to where they should be made. The late Dr. A. H. McClintock stated that he had so often seen the perineum escape laceration where this accident seemed inevitable, he was led to doubt the possibility of recognising the cases in which incision is an absolute necessity. . . . Tarnier states that the incisions do not always prevent even quite extensive tears, and they may leave deformity and a painful cicatrix, or the duct of one of the vulvo-vaginal glands may be divided and a fistula result. . . . He cautions against episiotomy unless it is quite indispensable, for he has sometimes seen the incised parts covered with eschars and become the medium of grave infectious accidents. Delore states that he accepts in extreme cases the slight operation, but in ordinary cases it is preferable to have a median rent which cicatrizes uniformly than two external ones which result in deformed cicatrices.'

"Dr. Parvin quotes two authors only, Dr. Broomall and Dr. Manton (whose names as obstetrical authorities are unknown to me), as favoring the operation, but sums up the matter in these words:

"'It may be stated that episiotomy will very seldom be plainly indicated, and in private practice will rarely be done.'

"Dr. Munro Kerr says:

"'It is an operation which is rarely required.'

"Dr. Dakin says of episiotomy, whether unilateral or bilateral:

"'This will possibly enable the head to pass the vulva more rapidly, but that is all that can be said for it. On the other hand, it is in the first place never certain that laceration will occur at all and the cuts may be useless and, what is more, afford an entrance to septic matter. In the second place, laceration may occur even when episiotomy has been done. In the third place, a tear made by the head, if properly sutured, heals most satisfactorily even when it extends into the rectum, and in these severe cases episiotomy would be useless. It is therefore not to be recommended under any circumstances unless a dense cicatricial condition of the perineum is found, when possibly some harm might be averted by a central incision carried as far as the sphincter if necessary.'

"Having given a few of the adverse opinions of obstetricians of great experience, with whose views I entirely agree, I may add that episiotomy incisions sometimes extend and, dividing the fascia and levator ani, give rise to rectocele of the most intractable kind. I have such a case under my care at the present time.

"I am, Sir, yours faithfully,

"HERBERT R. SPENCER, M.D., Lond."

Dr. Spencer may surely be regarded as a distinguished English authority on obstetrics and gynecology and in consideration of the advocacy of episiotomy by Dr. Williams and Dr. Phillips, it seems fair that Dr. Spencer's expert opinion, and others which he cites, should also be considered.

Very truly yours,

"OBSTETRICUS."

SCHOOL FOR HEALTH OFFICERS.

SPECIAL LECTURES IN JANUARY.

All lectures will be given from five to six o'clock on the dates specified and in the amphitheatre of Building E of the Harvard Medical School, unless otherwise indicated. All lectures will begin promptly on the hour.

January 4. "Oral Prophylaxis" (3 lectures). Dr. W. H. Potter, Professor of Operative Dentistry, Harvard Medical School.

January 6. "Infant Mortality" (3 lectures). Dr. John Lovett Morse, Associate Professor of Pediatrics, Harvard Medical School.

January 10. "Venereal Prophylaxis" (2 lectures). Dr. Hugh Cabot, Assistant Professor Genito-Urinary Surgery, Harvard Medical School.

January 11. "Oral Prophylaxis." Dr. W. H. Potter.

January 12. "Venereal Prophylaxis." Dr. Hugh Cabot.

January 13. "Sanitary Law" (6 lectures). Prof. Eugene Wambaugh, Professor of Law, Harvard Law School.

January 14. "School Hygiene" (2 lectures). Dr. T. F. Harrington, formerly Director of Hygiene, Boston Public Schools.

January 18. "Infant Mortality." Dr. John Lovett Morse.

January 19. "Oral Prophylaxis." Dr. W. H. Potter.

January 20. "Sanitary Law." Prof. Eugene Wambaugh.

January 21. "School Hygiene." Dr. T. F. Harrington.

January 24. "Maritime Quarantine" (2 lectures). Dr. S. B. Grubbs, U. S. Public Health Service.

January 25. "Infant Mortality." Dr. John Lovett Morse.

January 26. "Quarantine." Dr. S. B. Grubbs.

January 27. "Sanitary Law." Prof. Eugene Wambaugh.

January 28. "Industrial Hygiene." Dr. T. F. Harrington, Deputy Commissioner State Board of Labor and Industries.

HARVARD UNIVERSITY FREE PUBLIC LECTURES ON MEDICAL SUBJECTS.

The Faculty of Medicine of Harvard University offers a course of free public lectures, to be given at the Medical School, Longwood Avenue, Boston, on Sunday afternoons, beginning January 2, and ending May 7, 1916. The lectures will begin at four o'clock and the doors will be closed at five minutes past the hour. No tickets are required.

SUNDAY AFTERNOONS AT FOUR O'CLOCK.

Jan. 2. Dr. R. B. Greenough, "Cancer."

Jan. 9. Dr. W. H. Potter, "Military Dentistry; Experiences in a Three Months' Service in the American Ambulance Hospital, Paris.

Jan. 16. Dr. R. P. Strong, "Progress in Combating Epidemics of Some Infectious Diseases."

Jan. 23. Dr. R. B. Osgood, "Orthopedic Problems Presented by the European War."

Jan. 30. Dr. J. A. Honeij, "Leprosy."

Feb. 6. Dr. C. M. Smith, "Syphilis."

Feb. 13. Dr. F. H. Verhoeff, "Some Simple Facts Regarding the Eyes That Everyone Should Know.

Feb. 20. Dr. W. H. Robey, Jr., "The Value of Physical Examination to the Individual."

Feb. 27. Dr. C. J. White, "Occupation as a Contributing Factor to Certain Skin Diseases."

March 5. Dr. W. R. Bloor, "The Rôle of Fat in the Nutrition of Man."

March 12. Dr. F. S. Newell, "The Care of Pregnancy." (To women only.)

March 19. Dr. J. L. Goodale, "Hay Fever and Asthma."

March 26. Dr. F. W. White, "Chronic Indigestion."

April 2. Dr. J. R. Torbert, "A Comparison of the Methods for the Relief of Pain in Childbirth." (To women only.)

April 9. Dr. P. G. Stiles, "The Present Conception of an Adequate Diet."

April 16. Dr. G. B. Magrath, "Death by Accident; Some of Its Causes and How to Eliminate Them."
April 23. Dr. H. P. Mosher, "The Management of Foreign Bodies in the Trachea, Bronchi and Esophagus."
April 30. Dr. C. V. Chapin, "What the Individual Can Do to Protect Himself from Infection."
May 7. Dr. R. I. Lee, "The Importance of Physical Examination in Health as Shown by the Examination of Harvard Students."

Copies of this announcement and further information in regard to any of the lectures may be obtained by addressing The Chairman of the Committee on Public Lectures, The Harvard Medical School, 240 Longwood Avenue, Boston, Mass.

NOTICE.

THE MASSACHUSETTS GENERAL HOSPITAL will open a consultation clinic for people of moderate means on Tuesday, January 25, 1916. Every Tuesday and Friday afternoon at 2 P.M. patients referred by their physicians will be received at the Out-Patient Department on Fruit Street for consultation and diagnosis only. These are hours apart from those of the regular Out-Patient clinic.

Physicians are requested, if possible, to accompany their patients. When a physician is unable to accompany his patient, he will be expected to send a letter referring him to the hospital. This letter will be answered and as far as possible the diagnosis given and treatment suggested.

The clinic is designed for the benefit of families with small incomes. Diagnosis has become so complex and expensive in obscure and difficult cases that its cost has become a heavy burden to those who, nevertheless, are able and willing to pay something. It is expected that physicians will not refer to it people of considerable means.

A fee of $5.00 will be charged. When an x-ray examination is needed, a fee of $2.00 to $3.00 will be charged in addition. For certain other laboratory tests charges not to exceed $1.00 will be made. The $5.00 admission fee includes more than one visit when these are necessary for a diagnosis.

SOCIETY NOTICES.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.—A Semi-Annual Meeting of the Essex North District Medical Society will be held in Centre Church vestries, corner of Main and Vestry Street, opposite City Hall, Haverhill, Mass., (Tel. 548), Wednesday, January 5, 1916, at 12 noon, sharp.

A paper will be presented upon "The Public Health Nurse as an Educative Factor," by Dr. A. N. Little, Newburyport. (15 minutes.)

The balance of the meeting is devoted to symposium of three papers upon the work of the first Harvard Unit abroad. (20 minutes each) as follows:

"Otological Laryngological, and Rhinological War Surgery," by Dr. H. P. Mosher, of Boston.

"General War Surgery," by Dr. H. F. Hartwell, of Boston.

"War Medicine," by Dr. F. W. Snow, of Newburyport.

V. A. REED, M.D., *President*,
J. FORREST BURNHAM, M.D., *Secretary*.

NEW ENGLAND PEDIATRIC SOCIETY.—The fortieth meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, Jan. 7, 1916, at 8.15, P.M.

1. President's Address. A C. Eastman, M.D., Springfield.
2. "Indigestion with Fermentation." J. I. Grover, M.D., Boston.
3. "The Problem of Ringworm in Children." E. Lawrence Oliver, M.D., Boston.
4. "Results of Open-Air Treatment in Pneumonia." A. R. Cunningham, M.D., Boston.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President*,
RICHARD M. SMITH, M.D., *Secretary*.

The dates of the meetings for the rest of the year will be: Feb. 4; March 3; March 31; April 28.

HARVARD MEDICAL SOCIETY.—Historical club meeting in the Peter Bent Brigham Hospital Amphitheatre, Tuesday evening, January 4, 1915, at 8.15 o'clock.

PROGRAM.

1. "Sir James Paget and Paget's Disease," DR. E. C. Cutler.
2. "Benjamin Waterhouse." Dr. A. K. Stone.
3. Exhibition of books and papers.

Medical students and physicians are cordially invited to attend.

ERNEST G. GREY, M.D., *Secretary*.

APPOINTMENTS.

NEW YORK HEALTH DEPARTMENT.—In order to carry on the large amount of administrative work heretofore performed by the Deputy Commissioner, *Dr. John S. Billings*, until now Director of the Bureau of Preventable Diseases, has been designated to act as Deputy Commissioner. His place as Director of the Bureau of Preventable Diseases has been taken by *Dr. Bertram Waters*, heretofore Chief, Division of Tuberculosis, in that Bureau. *Dr. C. D. Martin* will act as Chief of the Division of Tuberculosis. The changes are merely official designations by the Board of Health and carry with them absolutely no changes in salary or Civil Service titles.

BOSTON DISPENSARY.—*Dr. Malcolm Storer* has been appointed surgeon-in-chief of the gynecological department. The associate surgeons appointed are *Dr. Edward I. Twombly*, *Dr. Robert L. DeNormandie*, and *Dr. Stephen Rushmore*. *Dr. A. K. Paine*, *Dr. John B. Swift* and *Dr. John T. Williams* have been appointed assistant surgeons; and *Dr. Raymond S. Titus* and *Dr. Foster S. Kellogg* assistants to surgeons.

RECENT DEATHS.

DR. A. MORGAN VANCE, who died on December 9 at Louisville, Ky., was widely known in his community as an orthopedic surgeon. He was president of the Kentucky State Medical Association and a fellow of the American College of Surgeons. He was sixty-one years of age.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION FOR THE WEEK ENDING DEC. 18, 1915.

CONTRIBUTIONS.

Buffalo Medical and Surgical League, Buffalo, N. Y.	$ 5.00
Washington County Medical Society, Calais, Me.	25.00
Mr. Leo J. Sys, St. Paul, Minn.	2.00
Receipts for the week ending December 18	32.00
Previously reported receipts	$7,873.84
Total receipts	$7,905.84
Total disbursements	7,310.04
Balance	$ 595.80

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VOL. CLXXIII
NO. 27

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THE RADICAL TREATMENT OF PERITONSILLAR ABSCESS BY TONSILLECTOMY DURING THE ACUTE STAGE OF THE DISEASE. *By Harry A. Barnes, M.D.*, Boston

NOTES OF A CONFERENCE ON THE MEDICAL AND SOCIAL ASPECTS OF SYPHILIS OF THE NERVOUS SYSTEM. (Continued)

THE SIGNIFICANCE OF CHANGES IN CELLULAR CONTENT OF CEREBROSPINAL FLUID IN NEURO-SYPHILIS. *By Harry C. Solomon, M.D.*, Boston, and *Hilmar O. Koefod, B.S.*, Boston

EDITORIALS

ADMISSION TO THE STATE TUBERCULOSIS SANATORIA.

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PEDIATRICS.

DIAGNOSIS OF SCURVY.

BROWN (*Arch. of Ped.*, Oct., 1915) presents a study of some new features in the diagnosis of scurvy with brief references to metabolic changes. His contribution is based on the observation of cases at the Toronto General Hospital. The four important points in diagnosis which he emphasizes are fever, leucocytosis, great radiability of recently extravasated blood and the presence of a white line at the junction of the epiphysis and diaphysis on the x-ray plate. He summarizes as follows his conclusions on these points and on the metabolic disturbances associated with the disease.

1. The absence of subperiosteal hemorrhage, as shown by Roentgen examination, does not exclude scurvy, as it has been shown that recently extravasated blood is very radiable and only when the disease is well advanced and some organization of the clot has occurred does it exhibit on the x-ray plate.
2. The first definite evidence of scurvy is the appearance of the "white line" which precedes the occurrence of the hemorrhages.
3. A high temperature with a polymorphonucleosis is not incompatible with a scorbutic condition, but occurs, on the other hand, only in the severe and most advanced cases, where a faulty diagnosis of pus is apt to be made, in which cases the presence of the "white line" is a valuable aid to diagnosis.
4. The association between scurvy, rickets, tetany and beri-beri is very intimate. The production of these various ailments occurs through the improper handling of our food stuffs, altering the constituents in such a way as to completely upset the proper balance of mineral salts within the organism. Why rickets is produced in one case, tetany in another and scurvy in another it is impossible to state. In rickets the loss of calcium is definite, while the evidence at hand shows that in tetany, sodium and potassium act as the irritating salts and calcium and magnesium as the sedatives. In scurvy the calcium retention is unexplained. It yet remains to be proven whether the vitamines are, as it were, the controllers of the mineral metabolism of the body. The rôle of the thyroid and parathyroid is purely that of assisting in the general metabolic processes. [R. M. G.]

PHYSIOLOGY, PHARMACOLOGY AND PATHOLOGY.

EFFECTS OF ARSENIC ON THE KIDNEY.

PEARCE AND BROWN (*Journal of Experimental Medicine*, Vol. 22, pp. 517, 525 and 535, November, 1915) report the results of chemo-pathological studies with compounds of arsenic. They found that each compound of arsenic tested tended to produce a lesion-complex in the kidney that is relatively characteristic for that compound. Some arsenicals produce changes in which vascular injury predominates, others produce an equally dominant tubular injury. In

(Continued on page vi.)

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The QUESTION *of* VITAMINES

The American Journal of Diseases of Children, March, 1914, contains an article which states that, after some months of experimental work on different food-products

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(*Continued from page iv.*)

a similar fashion adrenal injury seems to be an important factor in arsenical intoxication. The character and severity of the injury produced by the different arsenicals varies with the chemical constitution of the compounds. [R. I. L.]

AFFINITY OF STREPTOCOCCI FOR THE SAME KINDS OF ORGANS OR TISSUES FROM WHICH THEY ARE ISOLATED.

ROSENOW (*Jour. A. M. A.*, Nov., 13, 1915) reports on the rather remarkable affinity of streptococci, isolated from foci of various diseases, for the same kinds of organs or tissues from which they were isolated. Thus, 14 strains from appendicitis produced lesions in the appendix in 68% of the rabbits injected, which is in marked contrast to an average of only 5% of lesions in the appendix in the animals injected with the strains as isolated from sources other than appendicitis; 18 strains from ulcer of the stomach or duodenum produced hemorrhages in 60%, and ulcer of the stomach or duodenum in 60%, a combined total of 74% of the 103 animals injected, in contrast to an average of 20% hemorrhages and 9% ulcer following injection of other strains; 24 strains from rheumatic fever produced arthritis in 66%, endocarditis in 46%, pericarditis in 27%, and myocarditis in 44% of the 71 animals injected, in contrast to an average of arthritis in 27%, endocardial lesions in 14%, pericarditis in 2%, and myocarditis in 10% of the animals injected with strains from sources other than rheumatic fever. And so on down the list in such diseases as erythema nodosum, herpes zoster, epidemic parotitis, etc., the same kind of organ was affected in the large majority of cases. There exists an organotropic condition of streptococci which is analogous to the affinity of the tetanus toxin for the motor ganglion cells, of the diphtheria bacillus for the faucial tonsils, of the meningococcus for the meninges, etc. The value of these findings in the specific treatment of these diseases is evident. The injection of a streptococcus vaccine or antistreptococcus serum without regard to the tropic condition of the infecting strain, the one used in their preparation, is far from an exact method. These are experimental proof that chronic foci of infection play a most important rôle in causing systemic disease. [E. H. R.]

THE EFFECT OF BACTERIAL METABOLISM ON THE ANTIGENIC PROPERTIES AND SEROLOGIC REACTION OF BACTERIA.

SIMONS (*Jour. Inf. Dis.*, 1915, 17, No. 3, p. 500) shows that the agglutinative opsonic and lytic activities of the typhoid bacillus are considerably increased as a result of the growth of the organism in the presence of fermentable sugar. Such environment tends to reduce the virulence of the endotoxin. As a commentary it is suggested that this may be a factor in the favorable results obtained from Coleman's high calory, carbohydrate diet in typhoid fever.
[L. H. S.]

FURTHER EXPERIMENTAL WORK ON THE QUESTION OF COLLATERAL ARTERIAL CIRCULATION IN THE KIDNEY.

LIEK (*Archiv. f. klin. Chirurgie*, Vol. 106, Part 3) has an article of 75 pages in which he reviews the work which has been done on this subject and reports in detail a number of experiments of his own. In general, these consisted of interference with the renal

(*Continued on page viii.*)

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(Continued from page vi.)

blood supply by ligation of aorta or of renal arteries. Liek found that if the renal arteries are tied, there are always other arteries, branches of the aorta or of the arteries of the upper abdomen (suprarenal, lumbar, diaphragmatic, ureteral, etc.) which enlarge and carry blood into the kidney through its hilum, so that in post-mortem arterial injections, the renal arterial system fills with the injection fluid almost as well as if the renal arteries were not ligated. The compensatory enlargement of these small arteries often does not occur quickly enough to prevent necrosis of the kidney. If there already exists a well-developed supernumerary artery, the kidney may survive. Liek uses these facts to controvert the conclusions of Katzenstein, who attempted to prove that after ligation of the renal artery, the kidney could subsist upon blood delivered to it from a surrounding vascular tissue (omentum or muscle). [G. G. S.]

On the Hemolytic Action of the Urine in Certain Conditions.

McKee (*Brit. Med. Jour.*, Oct. 23, 1915) describes this phenomenon of fairly constant occurrence in certain morbid states, which has apparently hitherto escaped notice, namely the rapid laking of blood corpuscles by the urine. It has never been noted in the urine of normal individuals. The agent causing this hemolysis is left an open question, but there seems no doubt that it is not a normal constituent of the urine. Save in the case of certain strongly hemolytic alkaline urines, of which one drop sometimes causes instant laking of the blood emulsion at room temperature, the hemolytic process requires incubator temperature of 37° C. *In vitro*, sodium bicarbonate definitely influences the reaction, and possibly when administered to patients by mouth. A curious and apparently definite grouping of stable and unstable urines, so far as a change of reaction from acid to alkaline is concerned, has been remarked. This group of unstable urines may perhaps be found of prognostic value. Among the conditions in which he has found this form to exist are: pernicious anemia, erysipelas, gout, acute rheumatic fever, advanced tuberculosis, certain cases of syphilis, streptococcal throat, cases of severe burns, and certain skin cases.

[J. B. H.]

The Relation of the Adrenals to the Pancreas.

Mann and Drips (*Arch. of Int. Med.*, Oct., 1915) report experiments on dogs in which they studied the effect of adrenal insufficiency on the pancreas. The flow of pancreatic juice after adrenalectomy was observed and the gross and histologic changes in the pancreas after this operation were studied. They find that the pancreas develops a characteristic pink color and its blood vessels are injected to a maximum degree after double adrenalectomy. This condition is not dependent on the acid condition of the fluid in the stomach, but is probably associated with patent pancreatic ducts. The blood found in the injected pancreatic vessels cannot be removed by a free hemorrhage. In an anesthetized animal the flow of pancreatic juice is always slightly increased after removal of the adrenals. There is a marked decrease in the zymogen content of the pancreas in adrenalectomized animals.

On the other hand, the hyperemic condition of the pancrease does not take place until there is evidence that arterial tone is decreasing in the other organs. The increased flow of pancreatic juice in the anesthetized animal after removal of the adrenals is but little greater than that which occurs in the normal

(Continued on page x.)

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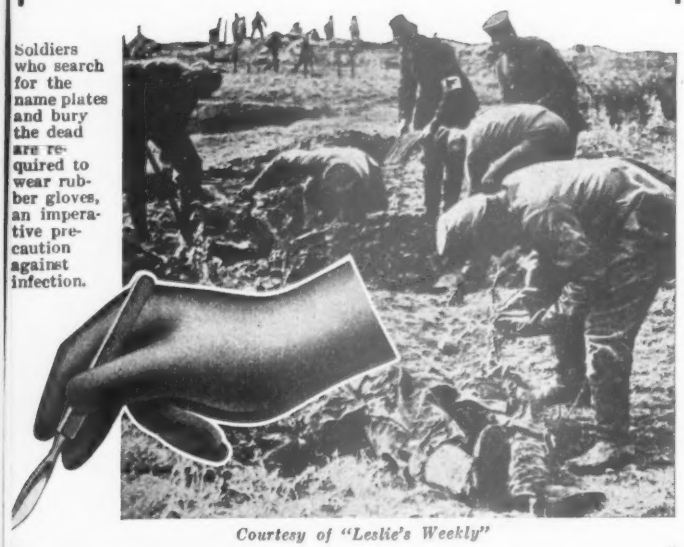

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(Continued from page viii.)

anesthetized dog under the same conditions as regards blood pressure, etc., and it does not exceed the increase incident to the trauma from removal of only one adrenal. The flow is insignificant as compared to the flow during the process of digestion. The decrease in zymogen content is proportional to the time of low blood pressure. All the changes found in the pancreas are proportionate to the length of time the animal was in a moribund condition and can be accounted for by the changes taking place in the organism as a whole due to decreased blood pressure, decreased temperature and other changes preceding death.

The writers conclude that their experiments fail to demonstrate any specific relationship between the adrenals and the pancreas. [L. D. C.]

THE PITUITARY BODY IN HIBERNATION.

CUSHING, H., and GOETSCH, E. (*The Journal of Experimental Medicine*, Vol. XXII, 1915, p. 25) made careful histological studies of a number of hibernating woodchucks. They found during the dormant period changes in many of the ductless glands. The most striking change was seen in the pituitary body. In view of these observations and other clinical and experimental studies, the writers attribute hibernation to a seasonal physiological wave of pluri-glandular inactivity, the essential rôle being played by the pituitary body. [R. I. L.]

ALVEOLAR AIR ANALYSIS.

ROMBERG'S CLINIC. Papers by STRAUB, BECKMAN, ERDT and METTENLEITER (*Deutsche. Archiv. f. klin. Medizin*, Bd. 117, 1915, p. 497.). The authors mentioned above have been studying the problems of blood acidity and respiratory control by means of the CO_2 tension in the alveolar air, using the Haldane method to show the CO_2 tension in the arterial blood and the Pletch method for showing the CO_2 tension in the venous blood. In the preceding number of this volume, papers have been presented by Straub and Beckmann, one of which was reviewed in a former number of this journal. Erdt has limited his work to a study of the daily variations in the CO_2 tension in the alveolar air and a determination of their causes. He has studied the daily variation on normal diets and also the effect of different types of diets, especially those rich and poor in carbohydrates and vegetable diets. In the arterial blood there is a rise in CO_2 tension which reaches a maximum in the late morning hours, toward noon it sinks a little and again rises in the afternoon. A second fall occurs in the late afternoon, which is followed by a third rise in the evening. The morning level on a fasting stomach is the lowest. The variations are only about 2 mm. The increase of the CO_2 tension occurs apparently with the outflow of acid into the digestive tract. The variations remain about the same on a carbohydrate-free diet. On a diet rich in alkalies (vegetable diet) the increase of CO_2 tension increases with the absorption of the alkalies but quickly returns to normal as the alkali is excreted. The abnormal acids formed on carbohydrate-poor diet are not so rapidly excreted as the alkalies taken by mouth with a vegetable diet, hence the fall in CO_2 tension produced by the carbohydrate-free diet is not so quickly recovered from. Variations quite marked occur in the difference between the CO_2 tension of the venous and arterial blood in the same person on different days.

Mettenleiter's paper deals with the gaseous exchange in the active muscular work of man. He

(Continued on page xii.)

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(Continued from page x.)

studied the CO_2 tension in both the arterial and venous blood during muscular work. The influence of a carbohydrate-poor diet upon metabolism of active muscles and the effect of severe continuous muscular activity were also studied by this method. Following muscular activity there is a sharp and marked rise in the CO_2 tension in both venous and arterial blood, more marked in the former, reaching as high as 80 mm. in the venous blood. Soon after the exercise the CO_2 tension in the arterial blood sinks below normal while that in the venous blood remains elevated for some time and therefore an increased excretion of CO_2 must take place. On a carbohydrate-free diet the variations were more pronounced, showing that more acids are formed under these circumstances than by muscle work on a mixed diet. After long continued severe muscle work a light acidiosis lasts for several days. [C. F., JR.]

GENITO-URINARY SURGERY.

SOME ERRORS IN THE DIAGNOSIS OF RENAL INFECTIONS.

CHUTE (*Surgery, Gynecology and Obstetrics*, October, 1915), gives a very clear picture of the symptomatology in renal infections. His remarks on pain are of particular value. He says: "In my opinion the greatest cause for errors in the diagnosis of renal infections is a lack of appreciation on the part of the general practitioner or surgeon under whose care these cases first come of the conditions under which renal infection gives pain and the sort of pain that such an infection usually gives. In the first place, I believe that due to the nerve supply of the kidney only a condition that suddenly puts tension on the kidney capsule causes pain. This limits the appearance of pain to acute infections that are attended with so much swelling or congestion as to sharply over-distend the renal capsule. That every acute infection of the kidney does not do this is proved by the great number of cases of acute pyelonephritis that one sees where there is relatively little pain, due to the fact that the swelling is not sufficient to distend the capsule to the painful point.

In the chronic renal infections, pain is not a prominent symptom unless there are combined with the infection attacks of intermittent obstruction that suddenly distend that part of the capsule covering the pelvis of the kidney. To have a typical pain across the small of the back of the type that so many people demand before suspecting an acutely infected kidney, it would be necessary to have a double renal infection—a relatively rare condition. The lack then, of pain which in the eyes of the general practitioner suggests pain of renal origin is one reason why many patients suffering from kidney infections are not sent to the men who have the means and skill by which alone accurate diagnosis of renal infection can be made.

Accounting for an elevation of temperature by a cystitis is a very common error. It is rare to see any appreciable elevation of temperature with a cystitis, and the urinary suppuration which is attended with any real elevation of temperature is almost invariably renal in origin.

[E. H. R.]

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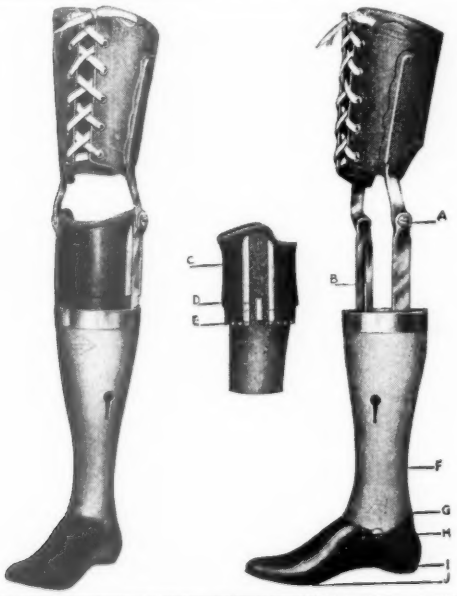

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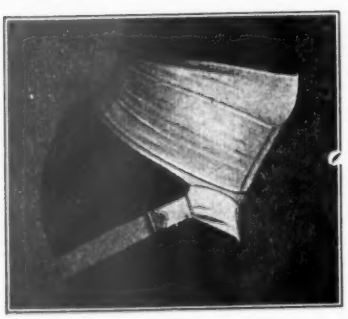

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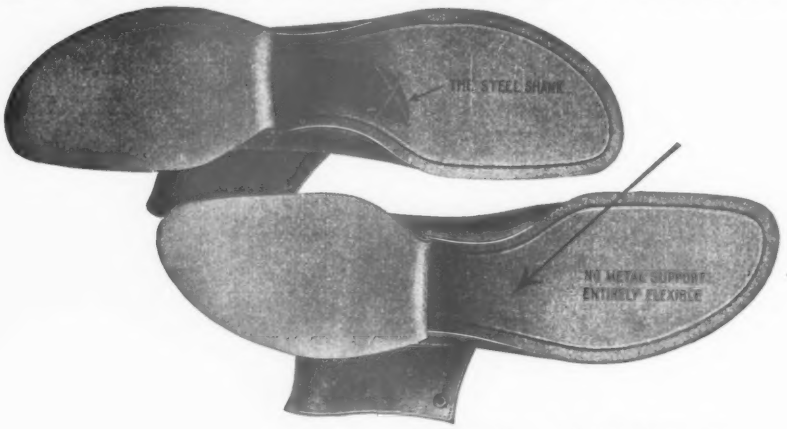

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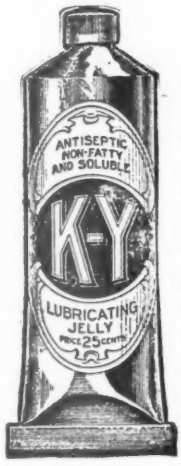

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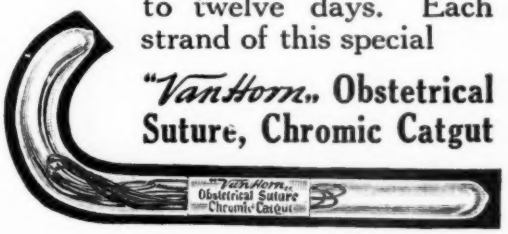

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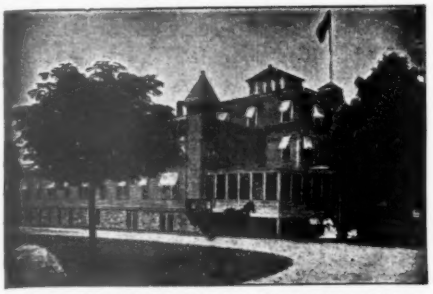

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